Electronic Authority Exchange

Hy-Rail Limits Compliance System Overview

June 14, 2001

Safety Alert: Self Critical Analysis

No. A-2000-19   September 12, 2000

BNSF Safety Vision

We believe every accident or injury is preventable. Our vision is that Burlington Northern Santa Fe will operate free of accidents and injuries.

Employee Fatally Injured

Date and Location of Accident/Incident:
August 28, 2000 4:05 p.m. Villa, Texas

Description of Accident/Incident:

   While a passenger in a hi-rail vehicle with a track supervisor, a 47-year-old welding supervisor was fatally injured after a vehicle/locomotive collision. The point of impact was on the main line approximately 5 miles outside of the limits of the track authority issued to the hi-rail operator/track supervisor.
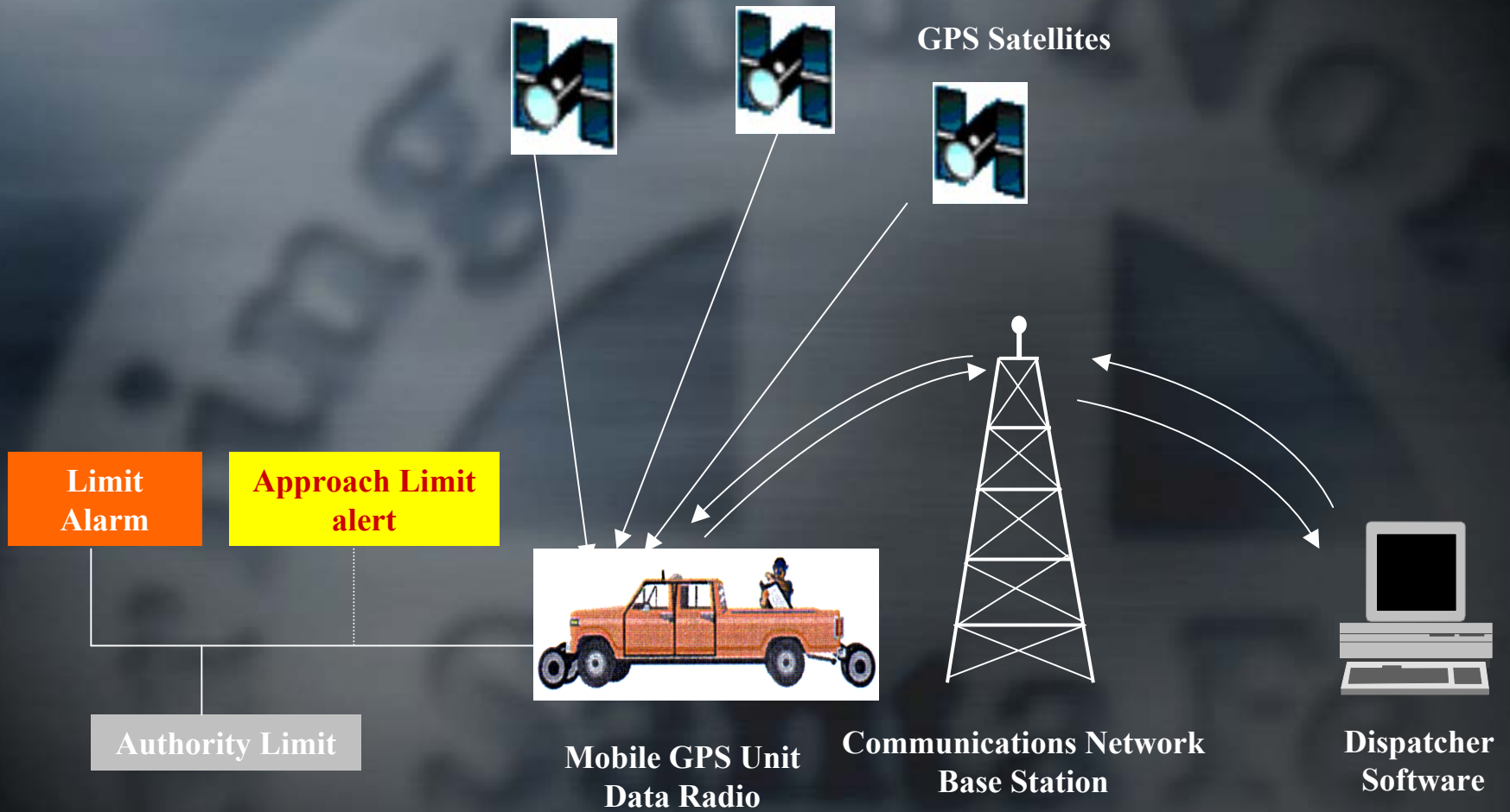
   The train crew on board the east bound local freight, traveling at approximately 45 mph, spotted the hi-rail stopped on the main line approximately 200 feet prior to impact. The operator was able to jump clear but the welding supervisor was unable to exit the vehicle before impact
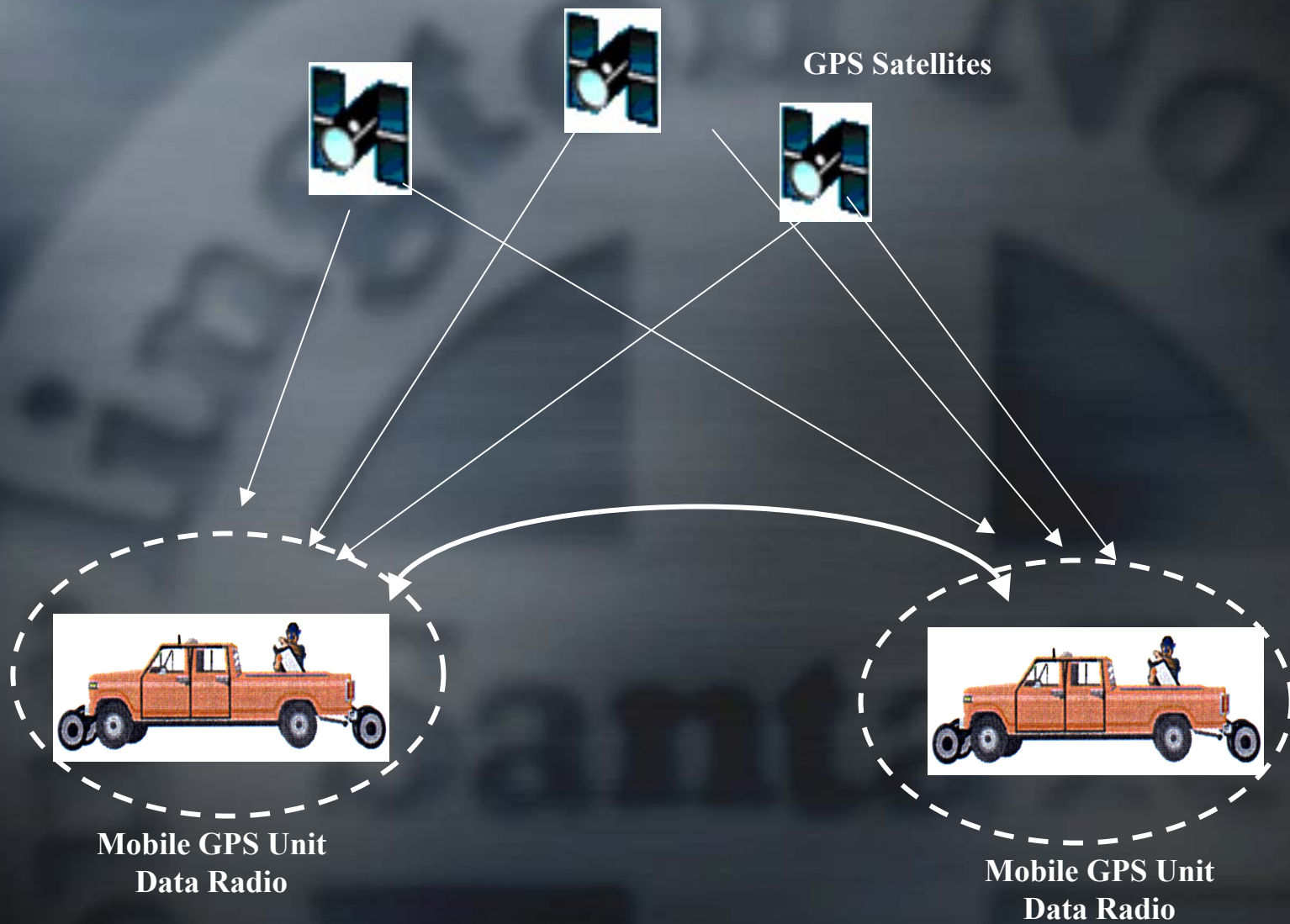
How the system works
in the Hy-Rail.

GPS

HLCS IS A SAFETY OVERLAY. This system will not replace any rule set currently in place!
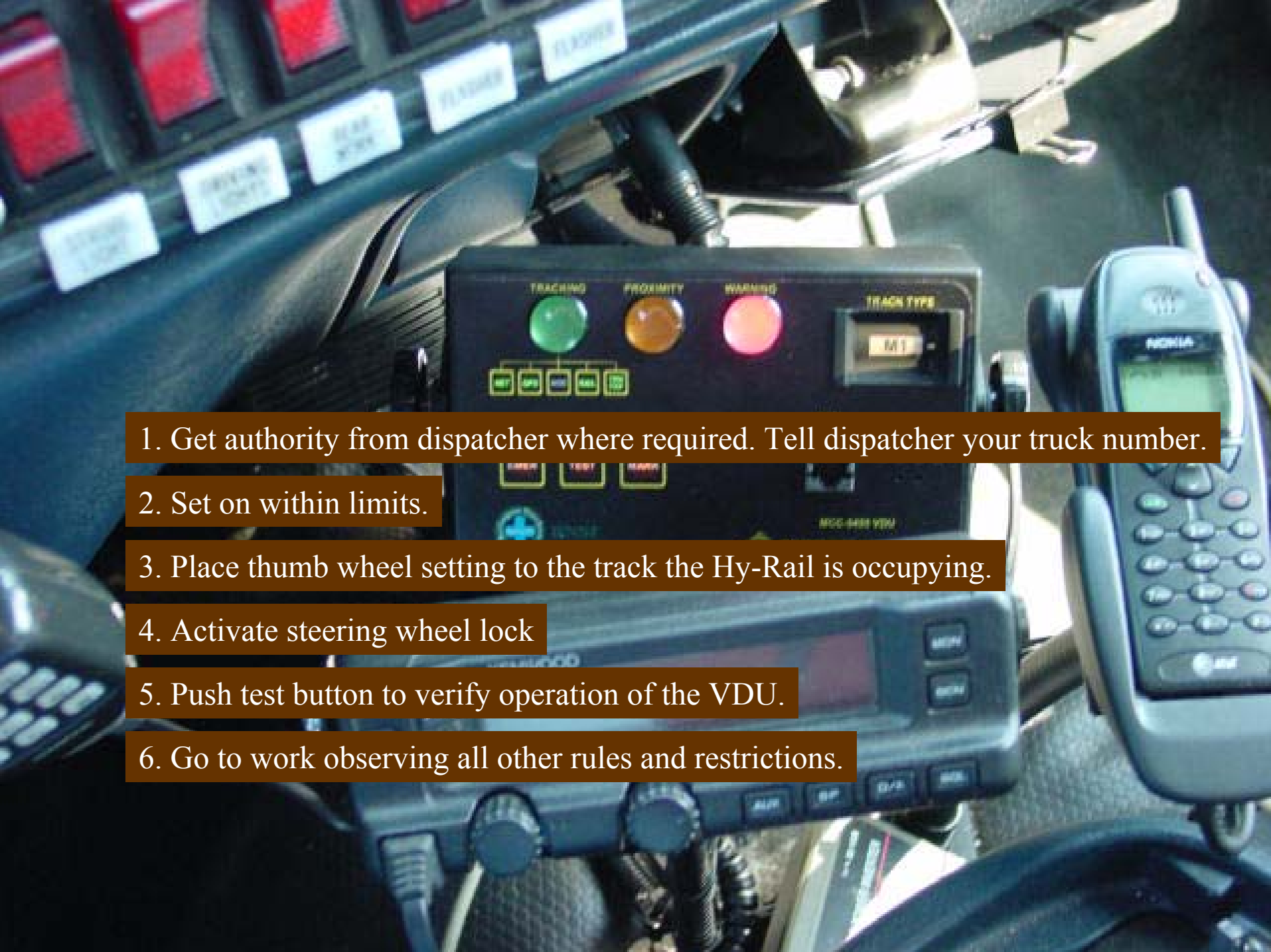
GPS Satellites

Limit Alarm

Approach Limit alert

Authority Limit

Mobile GPS Unit
Data Radio

Communications Network
Base Station

Dispatcher
Software

GPS Satellites

Mobile GPS Unit
Data Radio

Mobile GPS Unit
Data Radio

Typical Vehicle Installation

Base Loaded Whip Antenna

GPS Receiver Antenna

VDU
Vehicle Display Unit

Data Radio
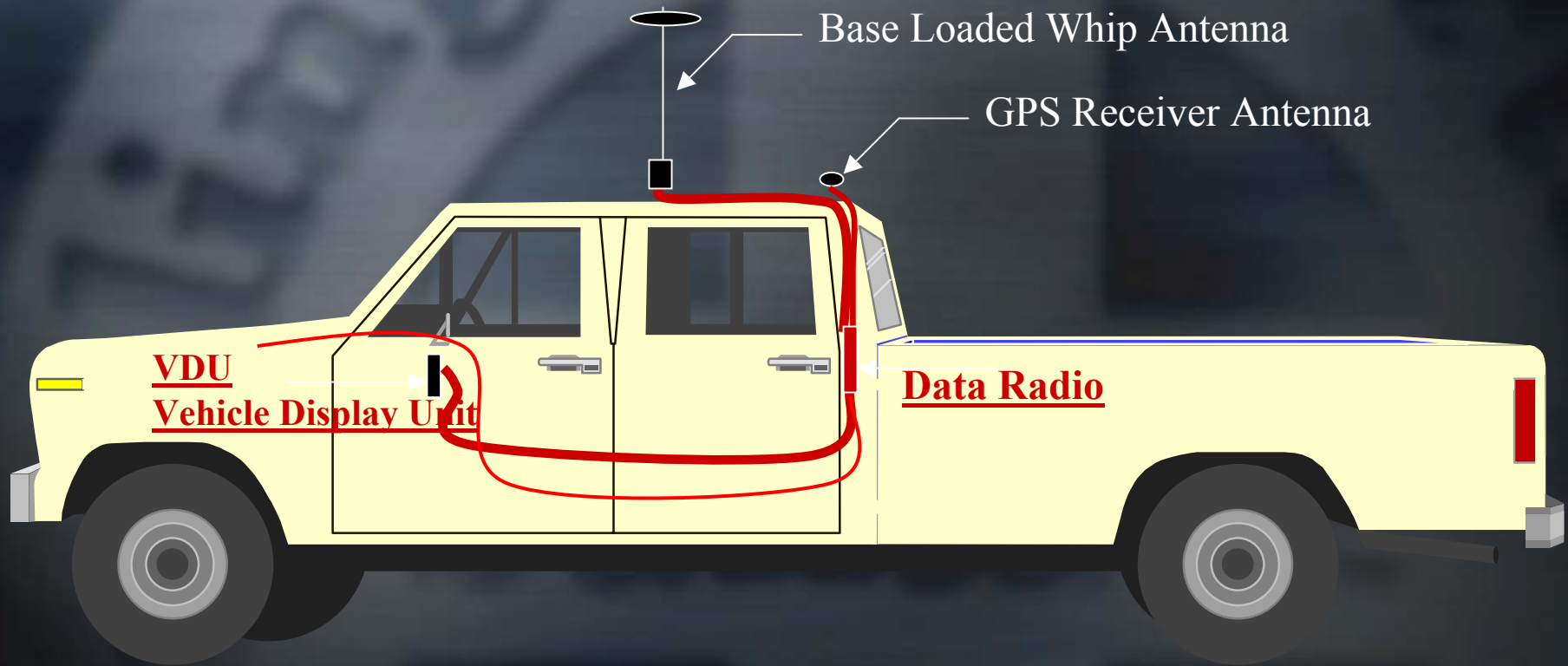
1. Get authority from dispatcher where required. Tell dispatcher your truck number.

2. Set on within limits.

3. Place thumb wheel setting to the track the Hy-Rail is occupying.

4. Activate steering wheel lock

5. Push test button to verify operation of the VDU.

6. Go to work observing all other rules and restrictions.

The TRACKING LED provides immediate confirmation to the vehicle operator that the system is functioning and the vehicle is being tracked.
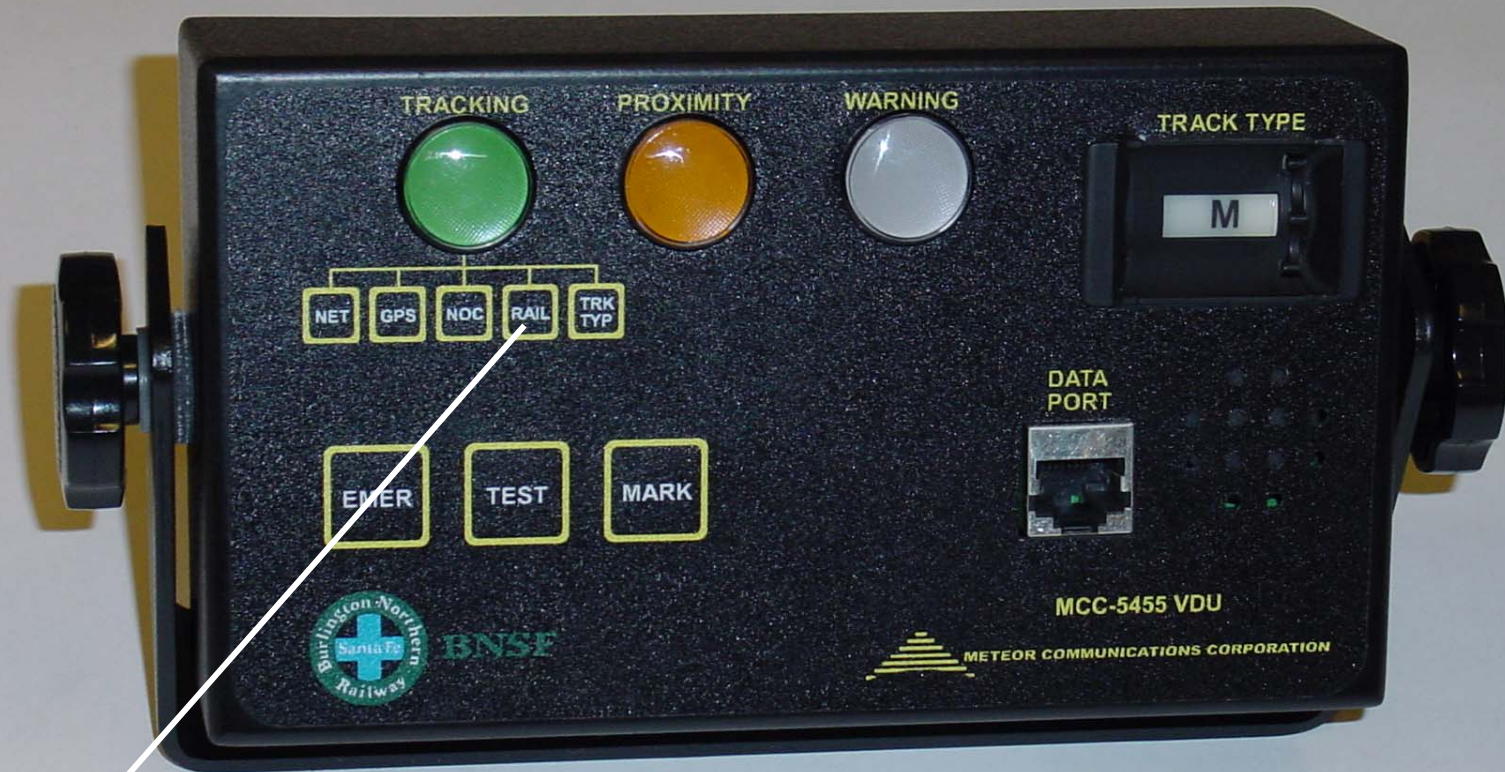
The NET status LED indicates the status of the radio communications link between the base station tower and the vehicle. If the NET LED turns OFF, indicating the vehicle is not within range of any base station tower the TRACKING LED also turns OFF.

The GPS status LED indicates the status of the GPS receiver located inside the data radio located on the vehicle. Causes of a GPS interruption could be a B/O receiver inside the truck or not receiving satellite information. Poor satellite coverage or environmental conditions such as an overpass can block satellite reception.

The NOC status LED indicates the status of the office-to-vehicle communications link. This confirms to the operator that the office is actively tracking the Hy-Rail vehicle.

The RAIL status LED indicates the status of the Hy-Rail vehicle. It automatically turns ON when the vehicle is on the track, which is indicated to the VDU via a relay contact closure in the steering wheel lock mechanism.
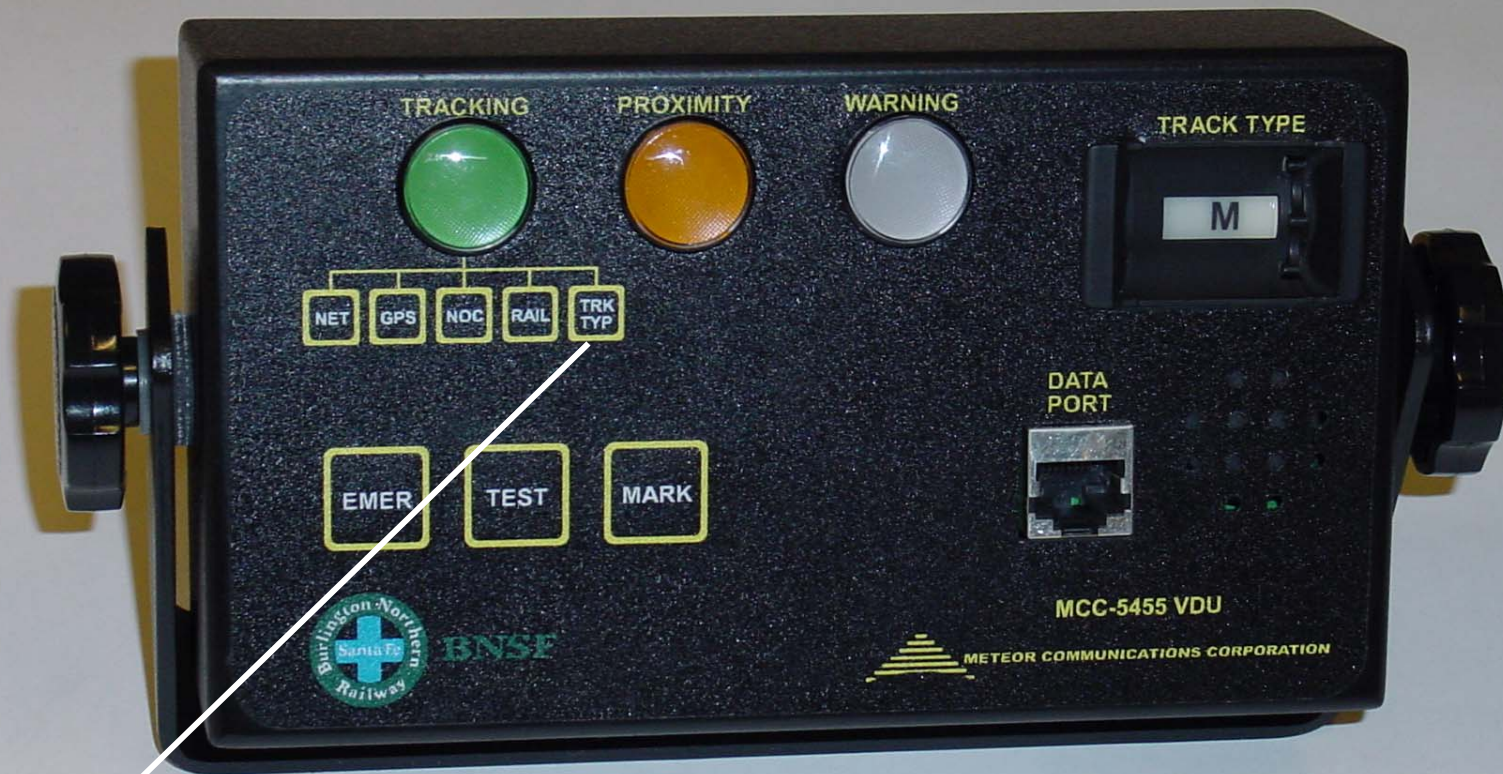
The TRK TYPE status LED indicates that the TRACK TYPE thumb wheel switch is set to any position except NA.
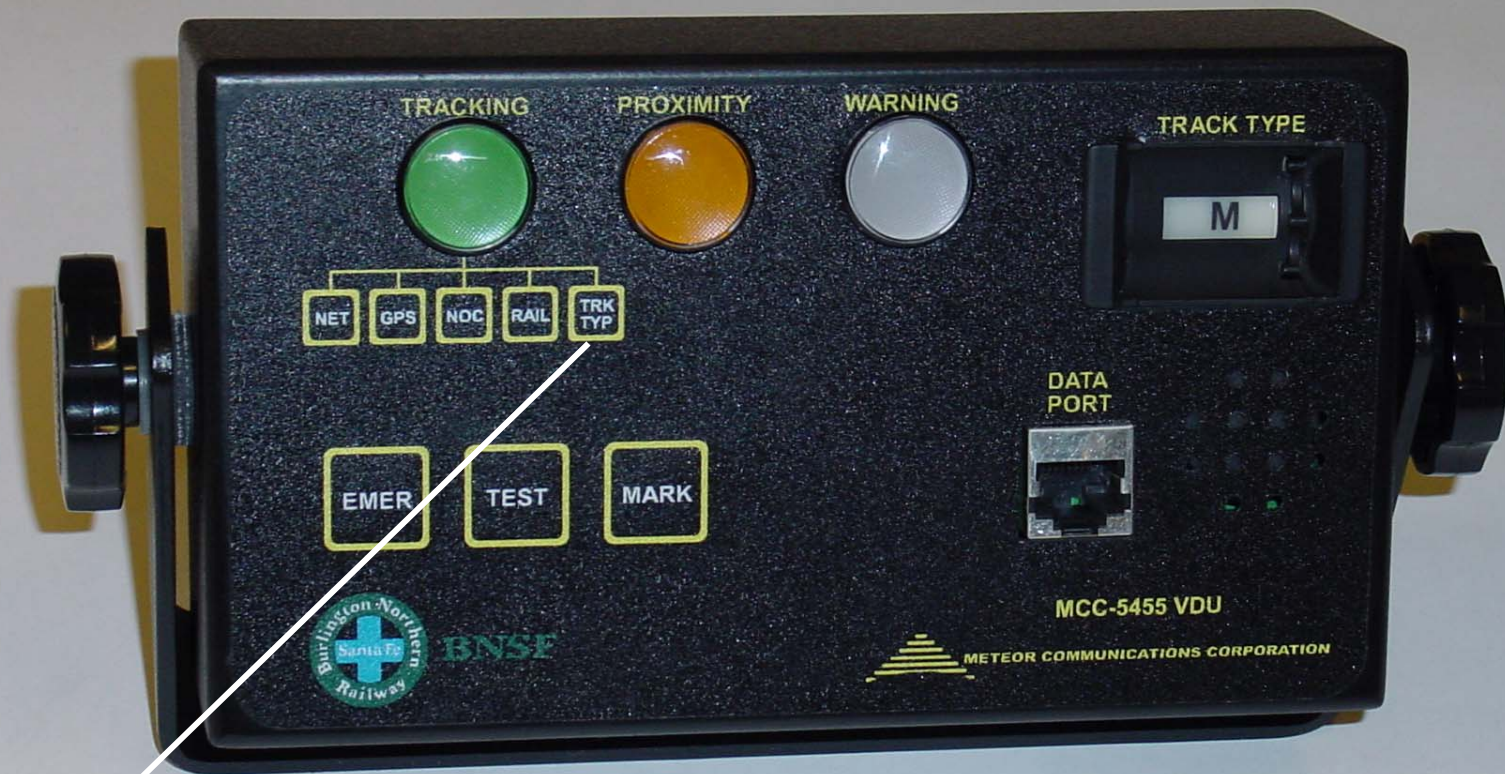
The TRK TYPE status LED will flash at every access point to the main track when the Track Type thumb wheel is in N/A or S. This flash along with a reminding "chirp" will alert the operator to check the thumb wheel setting.
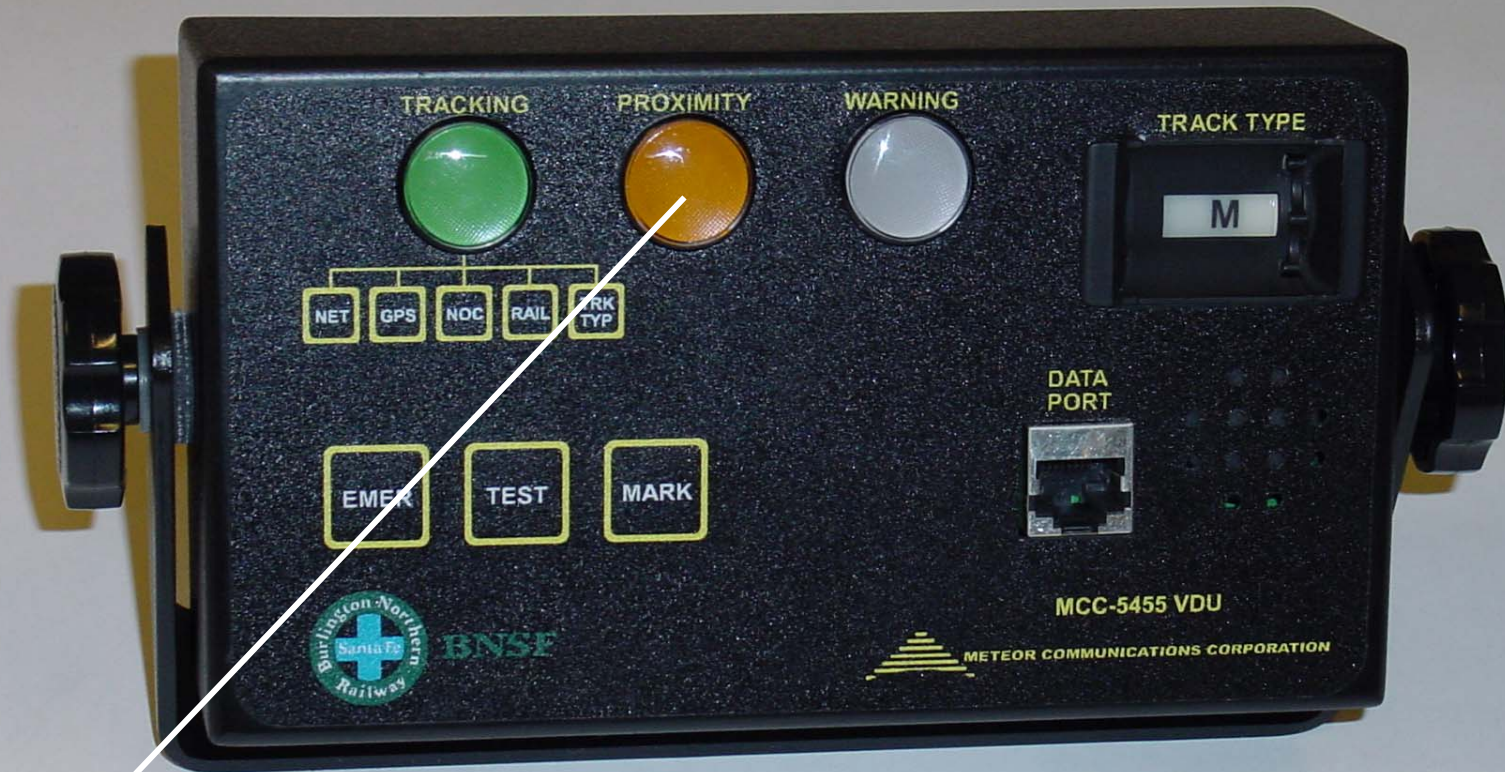
The PROXIMITY LED turns AMBER whenever another equipped unit is operating within its respective PROXIMITY radius.

The WARNING LED serves 2 purposes:
1. The WARNING LED turns AMBER whenever the vehicle is within 1 mile of its track limit. A pulsating audio alarm is also sounded.
2. The WARNING LED turns RED whenever the vehicle exceeds its authorized limits. A continuous audible alarm is also sounded.
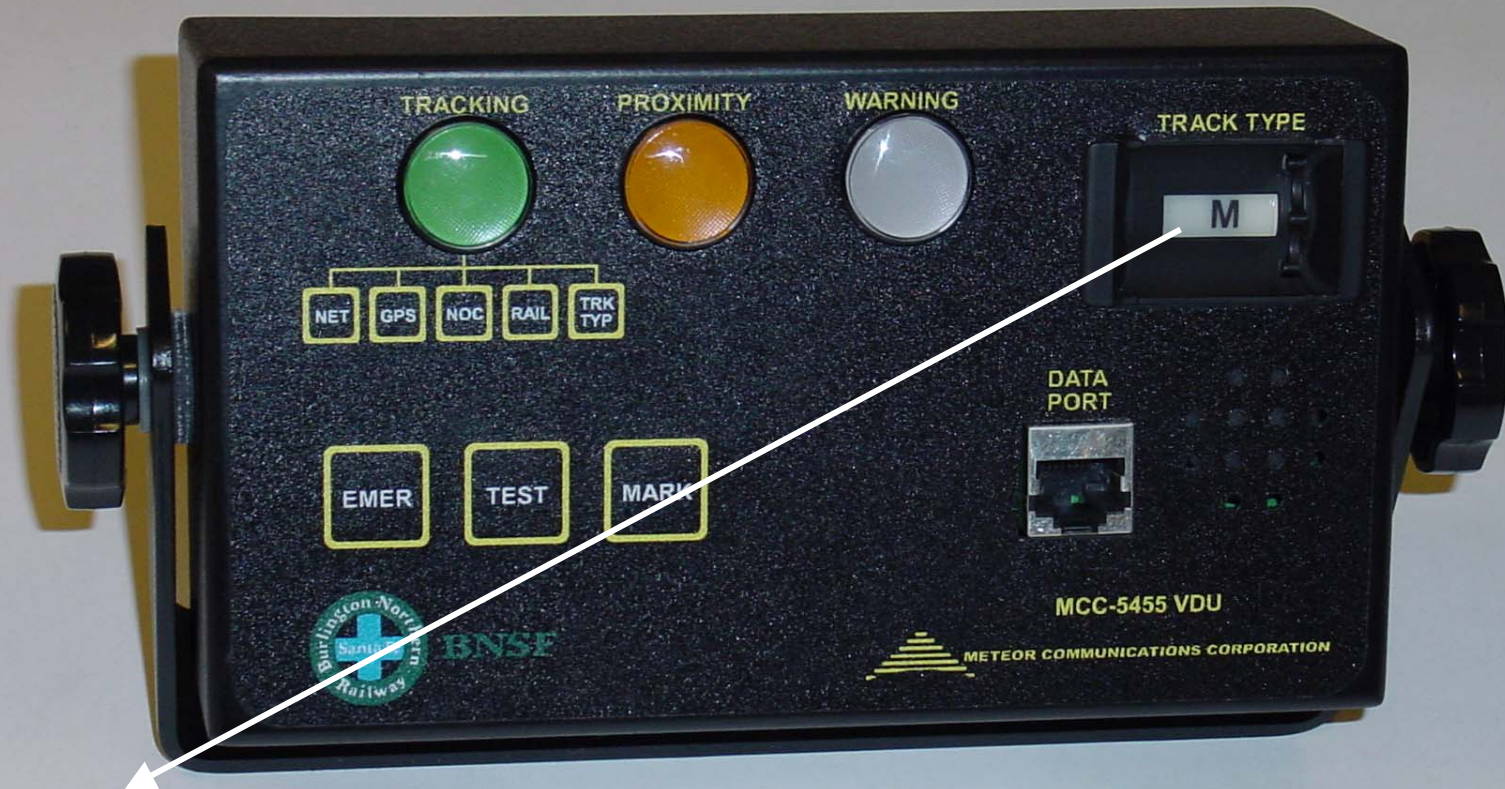
The TRACK TYPE thumb wheel selection switch provides the means by which the Hy-Rail operator tells the office of the current track on which the vehicle is running. The possible settings are S, M, M5, M4, M3, M2, M1, and N/A.

Dispatchers Office

TRAIN / FOREMAN SUPPLY SHEET

| Dispatcher: | AAA | DICKINSON SUBDIVISION | MAY 24 2001 |

| Type: | FOREMAN | Foreman: | SMITH | Unit ID: | N/A |

| Train ID: | N/A | Vehicle ID: | 96056 |

Name: FOREMAN SMITH

Additional GPS Vehicles

| Foreman2: | | Vehicle ID2: | |
| Foreman3: | | Vehicle ID3: | |

Origin: MANDAN

Destination: GLENDIVE

Crew Information :

		On Duty	Date	Off Duty	Date
Conductor:					
Engineer:					
Brakeman:					
Brakeman:					
Other:					

10:38:08 Thu May 24, 2001

[OK]   [Cancel]

3 ⬇ WESTWARD ⬇	JAMESTOWN	⬆ EASTWARD ⬆ 3

F I N C H | **J O N E S** | **S M I T H**

S U B D I V I S I O N | **M I L E P O S T**

S M I T H | **J O N E S** | **F I N C H**

FOREMAN
WORK
CLEAR
SIDING
MAIN

YL/RL

Location	Milepost
DILWORTH	3.2
SURREY JCT	30.9
WHEATLAND	34.1
MAGNOLIA	38.9
BUFFALO #	43.8
MP. 45	
TOWER CITY	49.7
KOLDOK #	52.4
PEAK	60.4
VALLEY CIT	65.5
SOUTH BERE	69.2
NORTH BERE #	70.2
SANBORN	76.1
ECKELSON	81.4
URBANA	85.3
SPIRITWOOD	89.1
BLOOM	94.7
JAMESTOWN	93.7x
ELDRIDGE	99.7x
WINDSOR	109.0
CLEVELAND	112.8
MEDINA	121.5
LADOGA	134.5
TAPPEN	137.5
DAWSON	143.2
STEELE	151.0
DRISCOLL	161.8
STERLING	169.6
MCKENZIE	176.2

Start Graphics Main Menu

Tracking screens enable authorized users to identify the exact location of on track equipment.

Limits Tracking

Foreman	Veh Id	TW	Subdiv	Milepost	Rpt Time	Dir	Spd	Trk GPS/	Whl/	TW
SMITH	96056	5439	JAMEST	34.00	10:31:20C	W	10	M	M1	M1
UNIDENTIFIED	12121	-----	JAMEST	46.20	10:31:20C	W	10	M	NA	--

Limits Tracking

Foreman	Veh Id	TW	Subdiv	Milepost	Rpt Time	Dir	Spd	Trk GPS/	Whl/	TW
SMITH	96056	-----	JAMEST	46.20	10:31:20C	W	10	M	M	--

Koldok

MP 45

MP 44

DT
Magnolia

Smith

CTC Surrey
JCT

M1

M2

Operating without HLCS
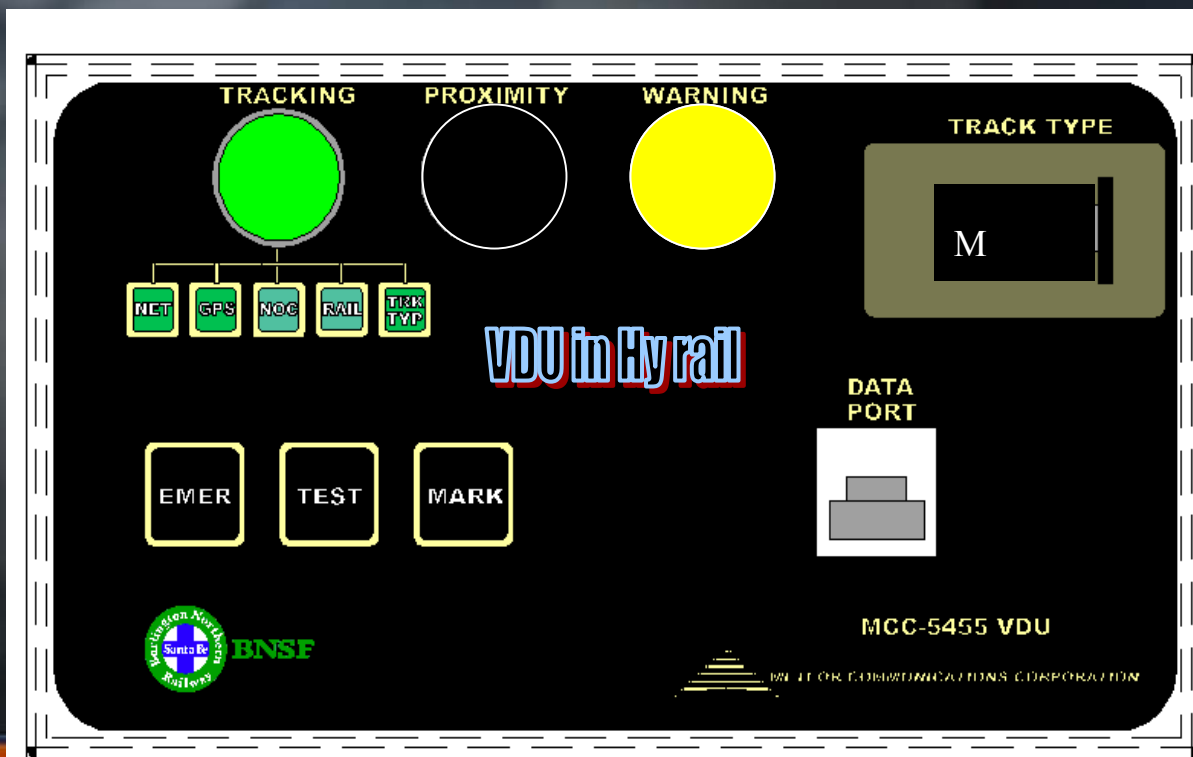
Koldok

MP 45

MP 44

h

DT
Magnolia

CTC Surrey
JCT

M1

M2

Dispatcher's workstation

Foreman	Veh Id	TW	Subdiv	Milepost	Rpt Time	Dir	Spd	Trk GPS/	Whl/TW	
SMITH	96056	5145	JAMEST	44.01	10:31:20C	W	10	M	M	M

TRACKING

PROXIMITY

WARNING

TRACK TYPE

M

NET GPS NOC RAIL TRK TYP

VDU in Hy rail

DATA PORT

EMER   TEST   MARK

BNSF
Burlington Northern Santa Fe Railway

MCC-5455 VDU

MELTOR COMMUNICATIONS CORPORATION

Koldok

MP 45

MP 44

Smith

DT
Magnolia

CTC Surrey
JCT

M1

M2

Foreman	Veh Id	TW	Subdiv	Milepost	Rpt Time	Dir	Spd	Trk GPS/ Whl/TW		
SMITH	96056	5145	JAMEST	44.01	10:31:20C	W	10	M	M	M

Limits Tracking

TRACKING   PROXIMITY   WARNING

TRACK TYPE

M

NET GPS NOC RAIL TRK TYP

VDU in Hy rail

DATA PORT

EMER   TEST   MARK

BNSF
Burlington Northern Santa Fe Railway

MCC-5455 VDU

METER COMMUNICATIONS CORPORATION

Koldok

MP 45 MP 44

DT Magnolia

CTC Surrey JCT

Smith

M1

M2

Dispatcher's workstation

Foreman	Veh Id	TW	Subdiv	Milepost	Rpt Time	Dir	Spd	Trk GPS/ Whl/TW
SMITH	96056	5145	JAMEST	44.01	10:31:20C	W	10	M M M

TRACKING   PROXIMITY   WARNING   TRACK TYPE

M

NET GPS NOC RAIL TRK TYP

VDU in Hy rail

DATA PORT

EMER   TEST   MARK

BNSF

MCC-5455 VDU

MELTOR COMMUNICATIONS CORPORATION

Koldok

MP 45

MP 44

DT Magnolia

CTC Surrey JCT

Smith

M1

M2

Dispatcher's workstation

Foreman	Veh Id	TW	Subdiv	Milepost	Rpt Time	Dir	Spd	Trk GPS/ Whl/TW		
SMITH	96056	5145	JAMEST	44.01	10:31:20C	W	10	M	M	M

TRACKING   PROXIMITY   WARNING

TRACK TYPE

M

NET GPS NOC RAIL TRK TYP

VDU in Hy rail

DATA PORT

EMER   TEST   MARK

BNSF
Burlington Northern Santa Fe Railway

MCC-5455 VDU

METEOR COMMUNICATIONS CORPORATION

Koldok

MP 45

MP 44

DT
Magnolia

CTC Surrey
JCT

Smith

M1

M2

Foreman	Veh Id	TW	Subdiv	Milepost	Rpt Time	Dir	Spd	Trk GPS/	Whl/TW
SMITH	96056	5145	JAMEST	44.01	10:31:20C	W	10	M	M M

Limits Tracking

TRACKING   PROXIMITY   WARNING

TRACK TYPE

M

NET GPS NOC RAIL TRK TYP

VDU in Hy rail

DATA PORT

EMER   TEST   MARK

BNSF

MCC-5455 VDU

MEDIOR COMMUNICATIONS CORPORATION

Koldok

MP 45

MP 44

DT
Magnolia

Smith

CTC Surrey
JCT

M1

M2

Dispatcher's workstation

Limits Tracking

Foreman	Veh Id	TW	Subdiv	Milepost	Rpt Time	Dir	Spd	Trk GPS/ Whl/TW
SMITH	96056	-----	JAMEST	46.20	10:31:20C	W	10	M M --

GPS Vehicle Id Acknowledge

WARNING!!!   GPS Indication Outside Authority Limits   WARNING!!!

Foreman	Veh ID	Subdivision	Milepost	Rpt Time
SMITH	96056	JAMEST	46.20	10:31:20C

TRACKING   PROXIMITY   WARNING

TRACK TYPE

M

NET GPS NOC RAIL TRK TYP

VDU in Hy rail

DATA PORT

EMER   TEST   MARK

BNSF

MCC-5455 VDU

| 3 ↓ | WESTWARD ↓ | | | JAMESTOWN | | | ↑ EASTWARD ↑ | 3 |
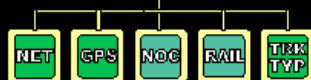
S M I T H	E L S T A D	K O P P			S U B D I V I S I O N	M I L E P O S T	K O P P	E L S T A D	S M I T H

Burlington Northern Santa Fe Railway

FOREMAN
WORK
CLEAR
SIDING
MAIN

| | 3 | 2 | 1 | YL/RL | | | 1 | 2 | 3 |

			DILWORTH	3.2
			SURREY JCT	30.9
			WHEATLAND	34.1
			MAGNOLIA	38.9
			BUFFALO	43.8
			MP. 45	
			TOWER CITY	49.7
			KOLDOK	52.4
			PEAK	60.4
			VALLEY CIT	65.5
			SOUTH BERE	69.2
			NORTH BERE	70.2
			SANBORN	76.1
			ECKELSON	81.4
			URBANA	85.3
			SPIRITWOOD	89.1
			BLOOM	94.7
			JAMESTOWN	93.7x
			ELDRIDGE	99.7x
			WINDSOR	109.0

| 1 4 1 4 5 | | | | | | | | | |

GPS Vehicle Id Acknowledge

WARNING!!!   GPS Indication Outside Authority Limits   WARNING!!!

Foreman	Veh ID	Subdivision	Milepost	Rpt Time
SMITH	96056	JAMEST	46.20	10:31:20C

			STERLING	169.6
			MCKENZIE	176.2

Start Graphics Main Menu

Koldok

Jones   Smith

Jones

TRACKING   PROXIMITY   WARNING

TRACK TYPE

M

NET GPS NOC RAIL TRK TYP

VDU in Hy rail

DATA PORT

EMER   TEST   MARK

BNSF

MCC-5455 VDU

MILLTOR COMMUNICATIONS CORPORATION

Smith

TRACKING   PROXIMITY   WARNING

TRACK TYPE

M

NET GPS NOC RAIL TRK TYP

VDU in Hy rail

DATA PORT

EMER   TEST   MARK

BNSF

MCC-5455 VDU

MILLTOR COMMUNICATIONS CORPORATION
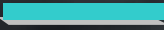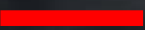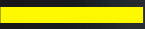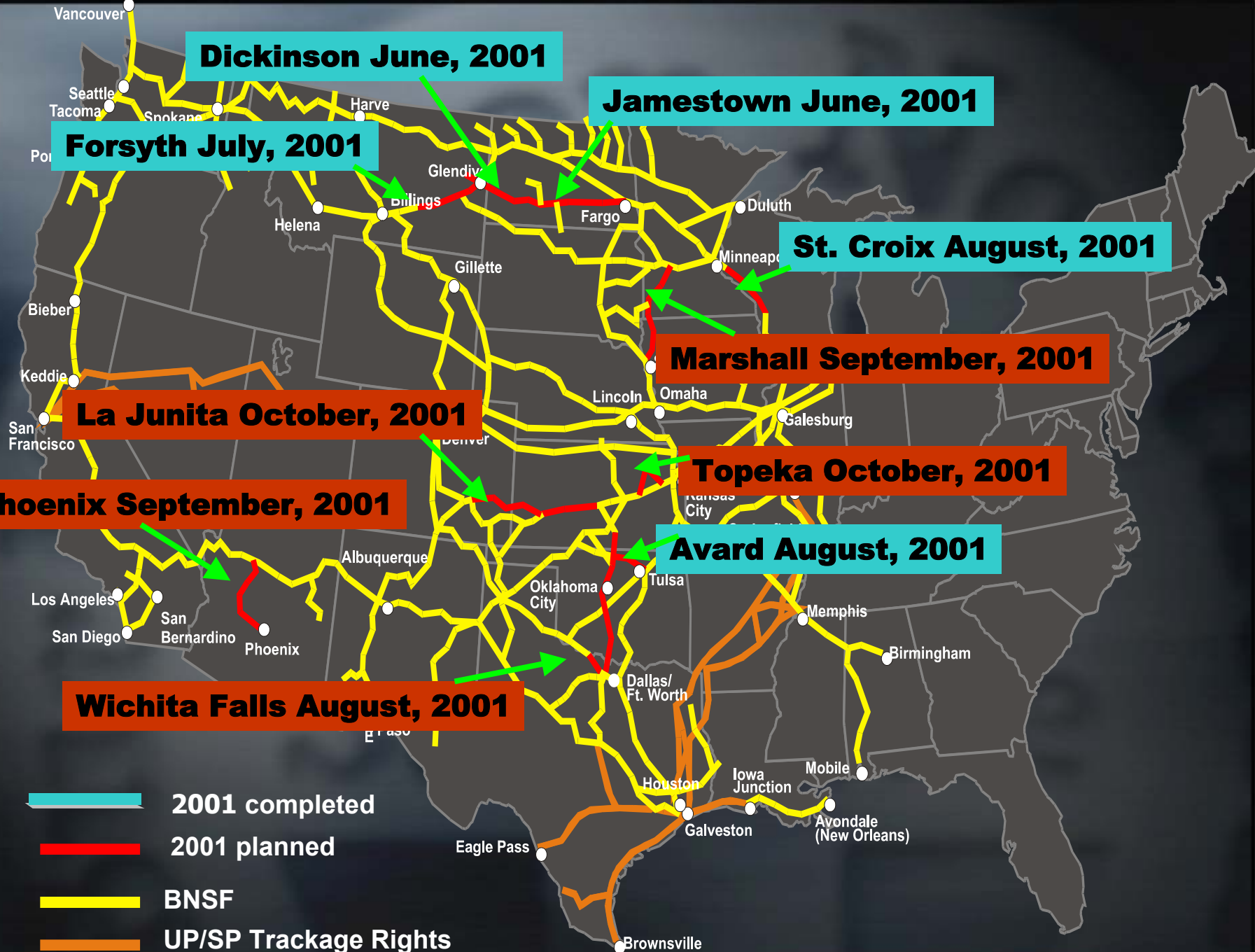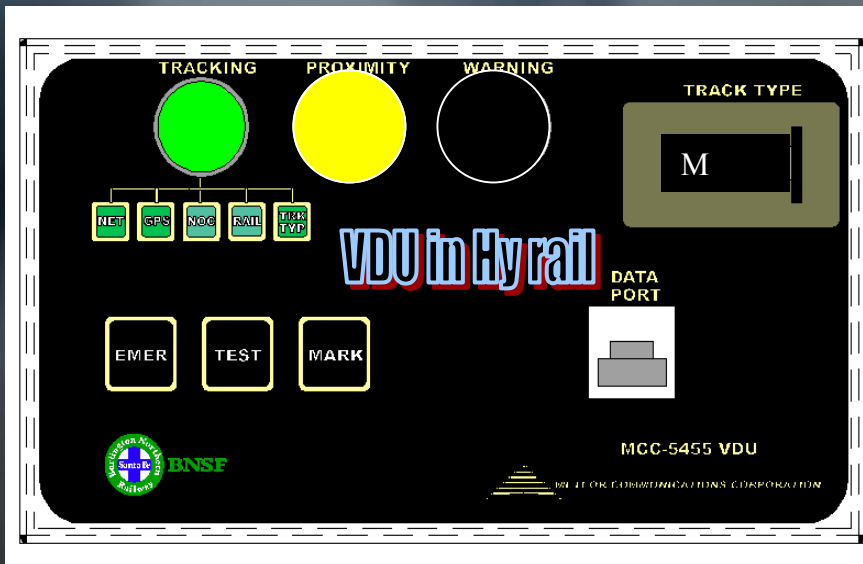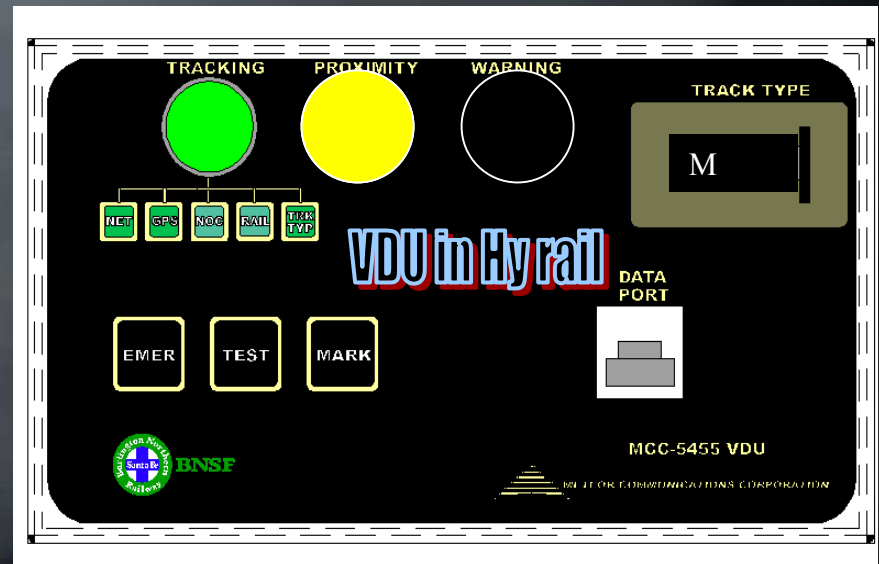
Jones   Smith

Future HLCS uses

- CTC limits compliance

- On board authority delivery

- Locomotive limits compliance

- Emergency notification

- Mark button capability

Electronic Authority Exchange

Benefits

- **Access to information traditionally available only to Dispatcher**
- **Extends vision and planning horizon of mobile personnel**
  - **Train location**
  - **Authorities**
  - **Observe potential maintenance windows**
- **Reduces Dispatcher conversations**
  - **Automates authority issuance**
  - **Increases safety by eliminating radio language exchange errors**
    - **Allows mobile to request, receive, and release authority without using voice communications**

INTERNET
(PUBLIC DOMAIN)

INTERNET
SERVICE
PROVIDER
FRAME
RELAY
NETWORK

Firewall

CELLULAR
DIGITAL
PACKET
DATA
(CDPD)

Cellular Tower

INTRANET
(BNSF)

Office Server

Mobile
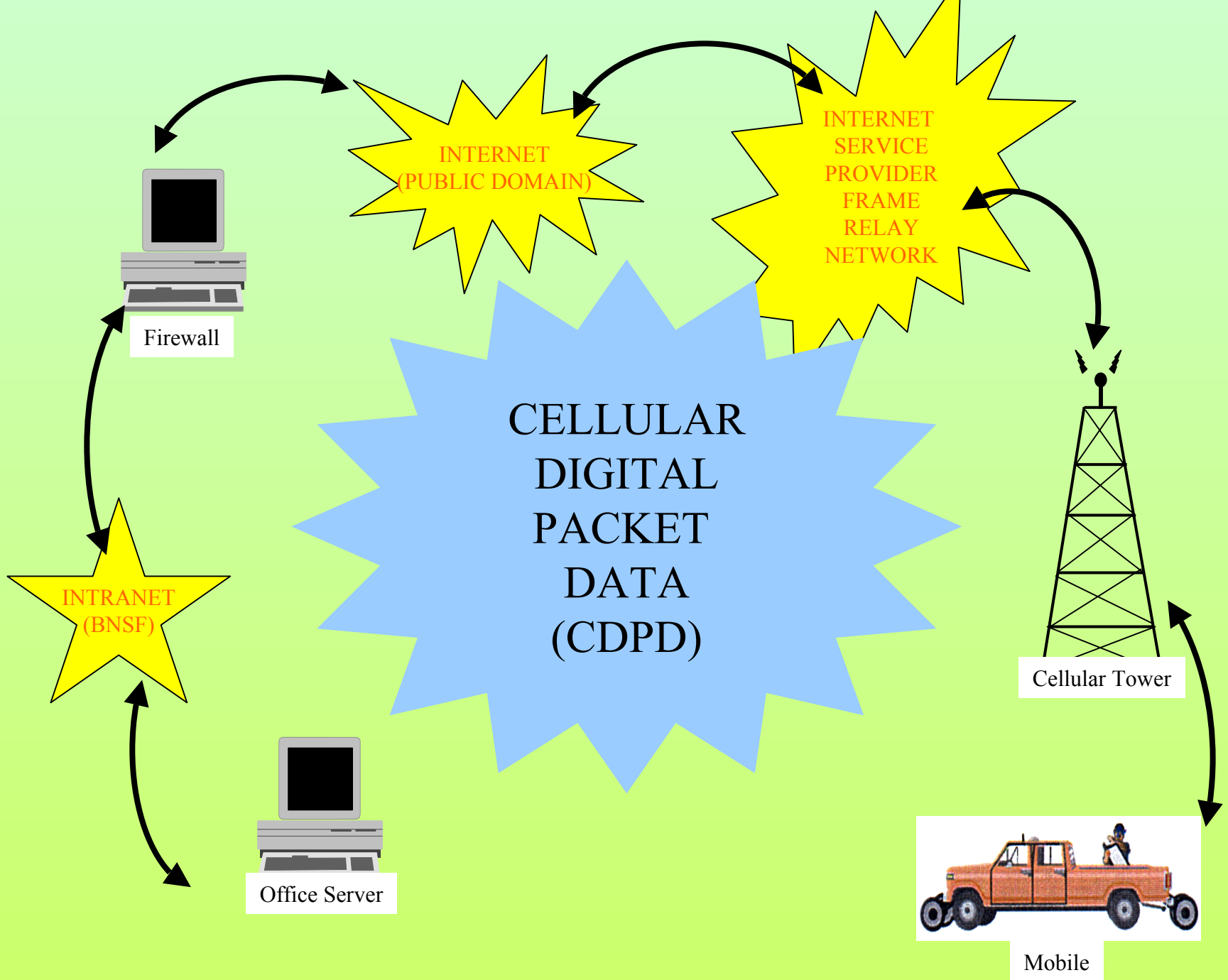
Security

- **System**
  - **CDPD encodes data in Digital Packets**
  - **Forward error correction**
  - **Encryption**
- **Workstation**
  - **Wireless workstation must have exchange node privileges**
- **User**
  - **Log on/ off password protection**
  - **Authority exchanger privileges granted to user (valid ID)**
  - **Authority ID of user must match user ID to use the system**

Functionality/HMI

- → **Mobile request of authority**
- → **Dispatcher granting authority**
- → **Dispatcher rejecting requested authority**
- → **Electronic field release of authority**

EASTBOUND TRAINS

TRAIN ID	ID UNIT	PRI	LAST OS STATION ARR/DEP	SCHEDULE ADHERENCE	LEN	LDS	EMP	TON	MAX SPD	HPT	TPOB	ENGINEER CONDUCTOR	HOS
GFTWGAL101	BNSF..4866 4866-5567	5.0	*MOVED 14:51C										

WESTBOUND TRAINS

TRAIN ID	ID UNIT	PRI	LAST OS STATION ARR/DEP	SCHEDULE ADHERENCE	LEN	LDS	EMP	TON	MAX SPD	HPT	TPOB	ENGINEER CONDUCTOR	HOS
EEOSEDM228	BNSF..6566 6566	5.0											
HAMATEM122	BNSF..4671 4671	5.0	PONDER D-13:58C										

TRACK AUTHORITIES

AUTH	ID NAME	TYPE	TRACK NAME	START LIMIT	END LIMIT	FROM	UNTIL
10019	BT JONES	SOLE T&T	SIDING TK	SWITCH, WEST HASLET, SW-N	SWITCH, CP 3624, SW-N	13:59	14:45

Log On

ID

PASSWORD

Enter USER ID and password

Mobile workstation

GPS　8/03/01　14:01:03

═══════════════════════════ EASTBOUND TRAINS ═══════════════════════════

TRAIN ID	ID UNIT	PRI	LAST OS STATION ARR/DEP	SCHEDULE ADHERENCE	LEN	LDS	EMP	TON	MAX SPD	HPT	TPOB	ENGINEER CONDUCTOR	HOS
GFTWGAL101	BNSF..4866	5.0	*MOVED 14:51C										
	4866-5567												

═══════════════════════════ WESTBOUND TRAINS ═══════════════════════════

TRAIN ID	ID UNIT	PRI	LAST OS STATION ARR/DEP	SCHEDULE ADHERENCE	LEN	LDS	EMP	TON	MAX SPD	HPT	TPOB	ENGINEER CONDUCTOR	HOS
EEOSEDM228	BNSF..6566	5.0											
	6566												
HAMATEM122	BNSF..4671	5.0	PONDER D-13:58C										
	4671												

═══════════════════════════ TRACK AUTHORITIES ═══════════════════════════

AUTH	ID NAME	TYPE	TRACK NAME	START LIMIT	END LIMIT	FROM	UNTIL
10019	BT JONES	SOLE T&T	SIDING TK	SWITCH, WEST HASLET, SW-N	SWITCH, CP 3624, SW-N	13:59	14:45

Authority Issuance ID

ID	JOHN DOE
Authority Issuance ID	DOE,JOHN

Mobile workstation

Authority Issuance ID must match the dispatchers workstation ID

| GPS | 8/03/01 14:01:24 |

EASTBOUND TRAINS

Train ID	ID Unit	Pri	Last OS Station Arr/Dep	Schedule Adherence	Len	Lds	Emp	Ton	Max Spd	HPT	TPOB	Engineer Conductor	HOS
GFTWGAL101	BNSF..4866 4866-5567	5.0	*MOVED 14:51C										

WESTBOUND TRAINS

Train ID	ID Unit	Pri	Last OS Station Arr/Dep	Schedule Adherence	Len	Lds	Emp	Ton	Max Spd	HPT	TPOB	Engineer Conductor	HOS
EEOSEDM228	BNSF..6566 6566	5.0											
HAMATEM122	BNSF..4671 4671	5.0	PONDER D-13:58C										

TRACK AUTHORITIES

Auth	ID Name	Type	Track Name	Start Limit	End Limit	From	Until
10019	BT JONES	Sole T&T	SIDING TK	SWITCH, WEST HASLET, SW-N	SWITCH, CP 3624, SW-N	13:59	14:45

Mobile workstation

User selects region to view the dispatchers trackline display

GPS   8/03/01   14:01:38

| Menu | Region | Preferences |

EASTBOUND TRAINS

TRAIN ID	ID UNIT	PRI	LAST OS STATION ARR/DEP	SCHEDULE ADHERENCE	LEN	LDS	EMP	TON	MAX SPD	HPT	TPOB	ENGINEER CONDUCTOR	HOS
GFTWGAL101	BNSF..4866 4866-5567	5.0	*MOVED 14:51C										

WESTBOUND TRAINS

TRAIN ID	ID UNIT	PRI	LAST OS STATION ARR/DEP	SCHEDULE ADHERENCE	LEN	LDS	EMP	TON	MAX SPD	HPT	TPOB	ENGINEER CONDUCTOR	HOS
EEOSEDM228	BNSF..6566 6566	5.0											
HAMATEM122	BNSF..4671 4671	5.0	PONDER D-13:58C										

TRACK AUTHORITIES

AUTH	ID NAME	TYPE	TRACK NAME	START LIMIT	END LIMIT	FROM	UNTIL
10019	BT JONES	SOLE T&T	SIDING TK	SWITCH, WEST HASLET, SW-N	SWITCH, CP 3624, SW-N	13:59	14:05

Region List

GAINVL - GAINESVILLE
HASLET - HASLET
JUSTIN - JUSTIN

This menu contains only the regions assigned to this user

Mobile workstation

Region | GPS | 8/03/01 14:01:43
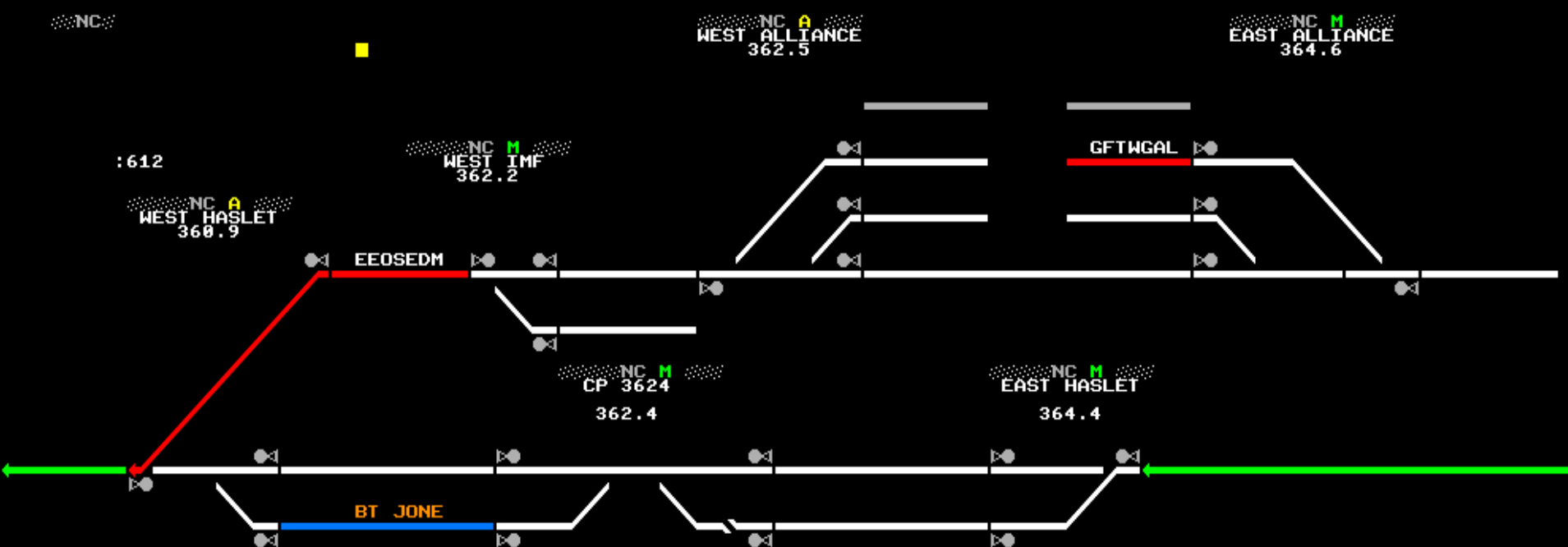
For the first time in railroad history a mobile
user can see the same thing that the dispatcher sees!

The mobile user can see where potential work windows
are based on train locations. Now the user can
request authority.

Requesting track authority

Select the beginning location of the authority.

Mobile workstation

Selecting Authority Type (Sole or Joint)

Mobile workstation

Selecting minimum usable time

Mobile workstation

Entering comments in request

Mobile workstation

Requested Limits

Mobile workstation

NC

NC A
WEST ALLIANCE
362.5

NC M
EAST ALLIANCE
364.6

:612

GFTWGAL

NC M
WEST IMF
362.2

NC A
WEST HASLET
360.9

EEOSEDM

DOE,JOH

DOE,JOH

NC M
CP 3624
362.4

NC M
EAST HASLET
364.4

BT JONE

NC M
EAST IMF
365.0

NC M
CP 3663
366.3

NC M
LAMBERT
368.5
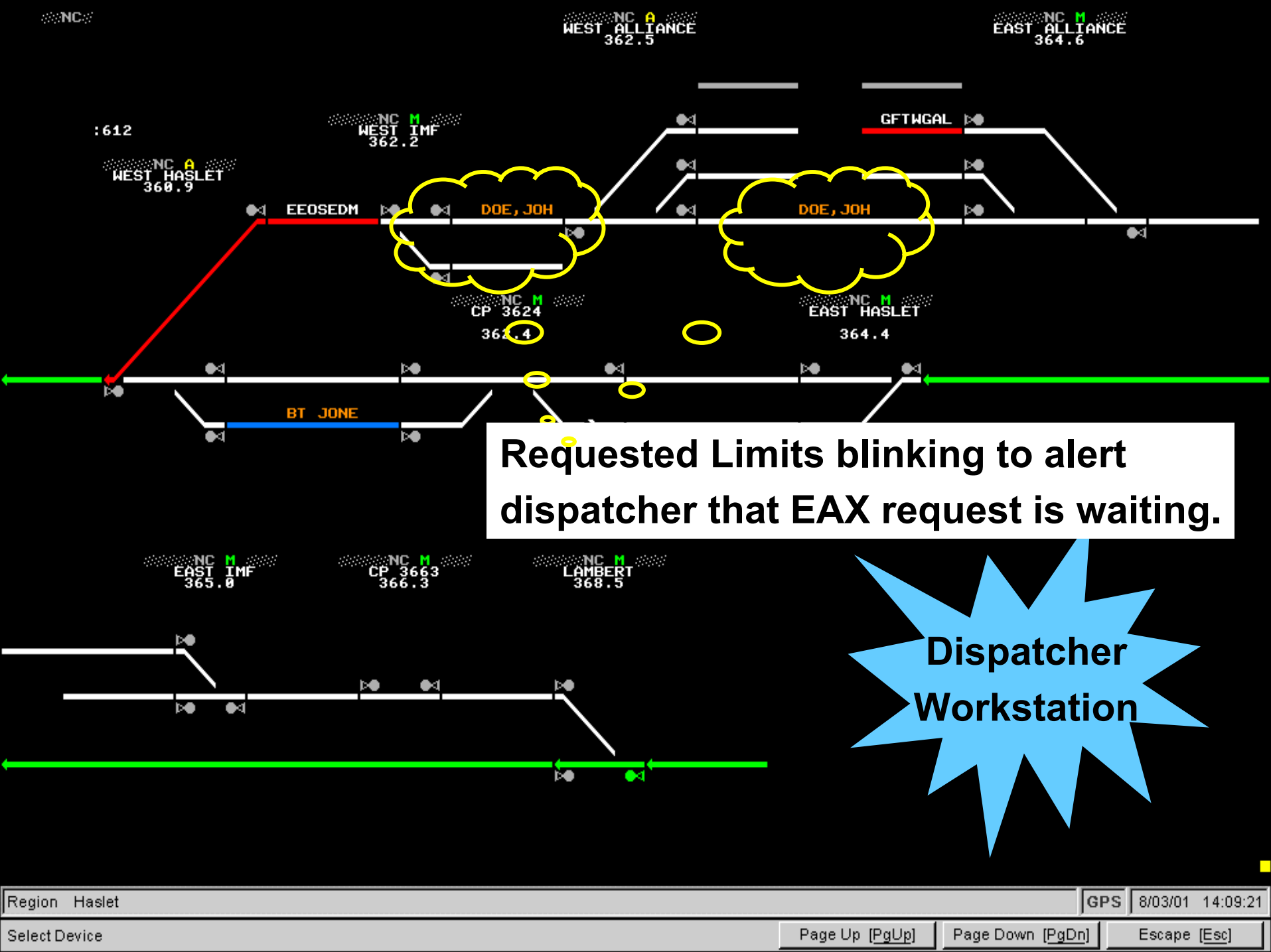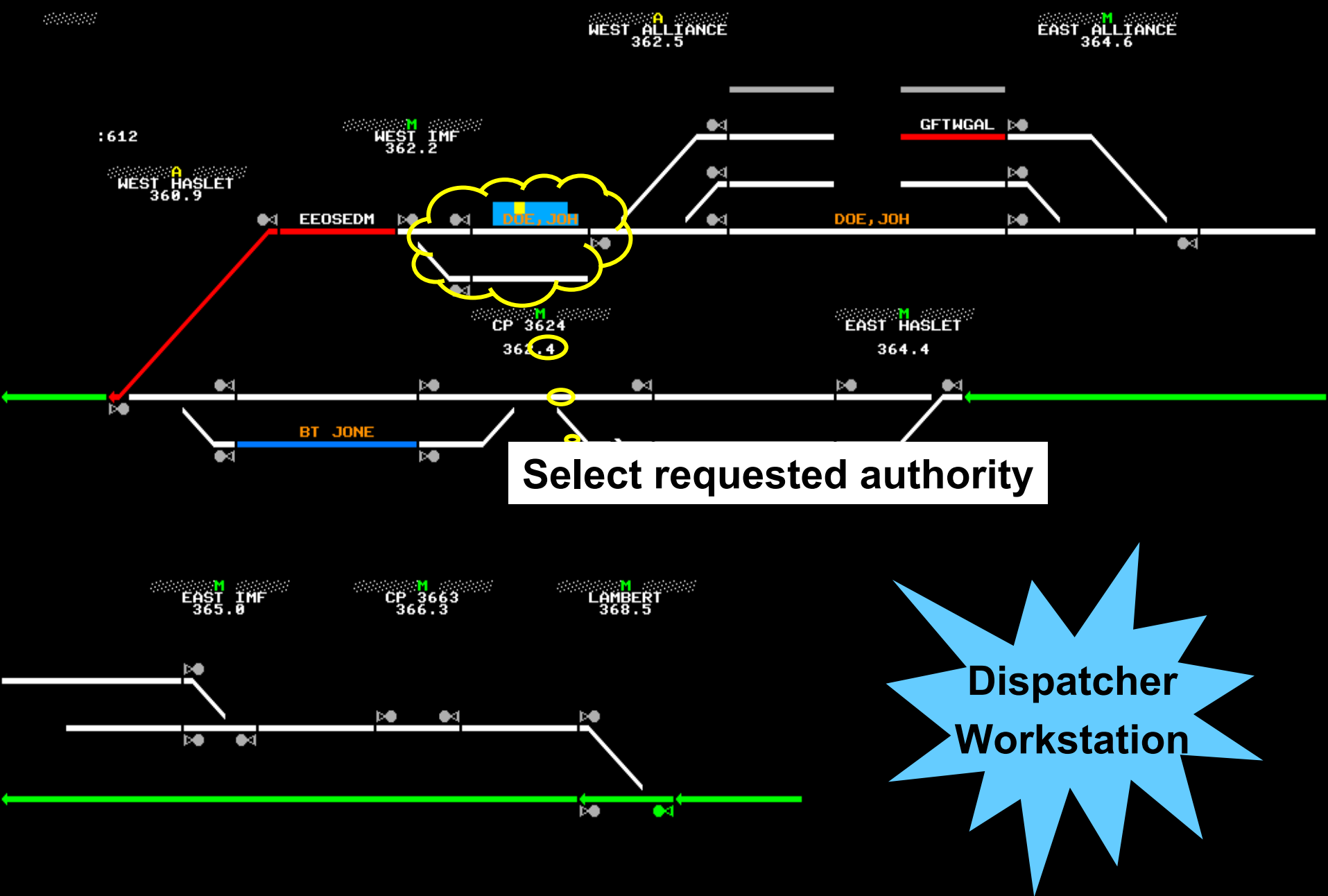
Requested Limits blinking to alert dispatcher that EAX request is waiting.

Dispatcher Workstation

Process EAX authority

Dispatcher Workstation

WEST ALLIANCE
362.5

EAST ALLIANCE
364.6

GFTWGAL

:612

WEST IMF
362.2

WEST HASLET
360.9

EEOSEDM

DOE,JOH

DOE,JOH

Select Until Time

Requested Authority:

ID	DOE,JOHN
Requested At	14:09
Limits	BETWEEN SWITCH, WEST IMF, SW-N AND SWITCH, EAST ALLIANCE, SW-N
Requested Time	1:00 - 3:00
Comments	WELDING ON A FROG

Authority Expires at **17:10**

EAST IMF
365.0

CP 3663
366.3

LAMBERT
368.5

Review requested authority

Dispatcher Workstation

QuickControl Haslet Process Requested eAX DOE,JOHN   FG 8/03/01 14:09:49

| Issue | Save | Check ETAs | Reject | Send Message | Insert [Ins] |

WEST ALLIANCE 362.5
EAST ALLIANCE 364.6

:612

WEST IMF 362.2

WEST HASLET 360.9

GFTWGAL

EEOSEDM   DOE,JOH   DOE,JOH

Select Until Time

Requested Authority:

ID	DOE,JOHN	
Requested At	14:09	
Limits	BETWEEN SWITCH,	SWITCH, EAST ALLIANCE, SW-N
Requested Time	1:00 - 3:00	
Comments	WELDING ON A FR	

	16:15
15:10	16:30
	16:45
15:30	17:00
15:45	17:15
16:00	

Authority Expires at

EAST IMF 365.0

CP 3663 366.3

LAMBERT 368.5

Dispatcher Workstation

Dispatcher changes expiration time based on train ETA's. The limits cannot be changed by the dispatcher.

QuickControl   Haslet   Process Requested eAX   DOE,JOHN   FG 8/03/01 14:10:17

WEST ALLIANCE
362.5

EAST ALLIANCE
364.6

GFTWGAL

:612

WEST IMF
362.2

WEST HASLET
360.9

EEOSEDM

Issue Track Authority

DOE,JOHN, authority number 10020 granted
on SIDING TK between SWITCH, WEST IMF, SW-N and SWITCH, EAST ALLIANCE, SW-N
until 1615.

Continue with authority? (Y/N)

After continue, authority will be transmitted electronically.

EAST IMF
365.0

CP 3663
366.

LAMBERT
368.5

Dispatcher reviews the authority before sending electronically

Dispatcher Workstation

QuickControl   Haslet   Process Requested eAX   DOE,JOHN   FG 8/03/01 14:10:36

| Continue Y | Add/Delete IDs | Check Graphics | Check ETAs | Stop N |

Authority has been issued by the dispatcher and blocking is in place.

Dispatcher Workstation

Mobile user receives notice that an authority is waiting.

Mobile workstation

14:10:41 ;REMATHRXATHCB-Press {F4} for authority 10020

GPS   8/03/01 14:16:19

Select Device   Page Up [PgUp]   Page Down [PgDn]   Escape [Esc]

Mobile user reviews authority.

Mobile workstation

Confirm Track Authority

DOE,JOHN, authority number 10020 granted
on SIDING TK between SWITCH, WEST IMF, SW-N and SWITCH, EAST ALLIANCE, SW-N
until 1615.

Continue with authority? (Y/N)

14:10:41 : REMATHRX ATHCB - Press [F4] for authority 10020

GPS   8/03/01   14:16:19

Continue Y

Mobile reviews OK time.

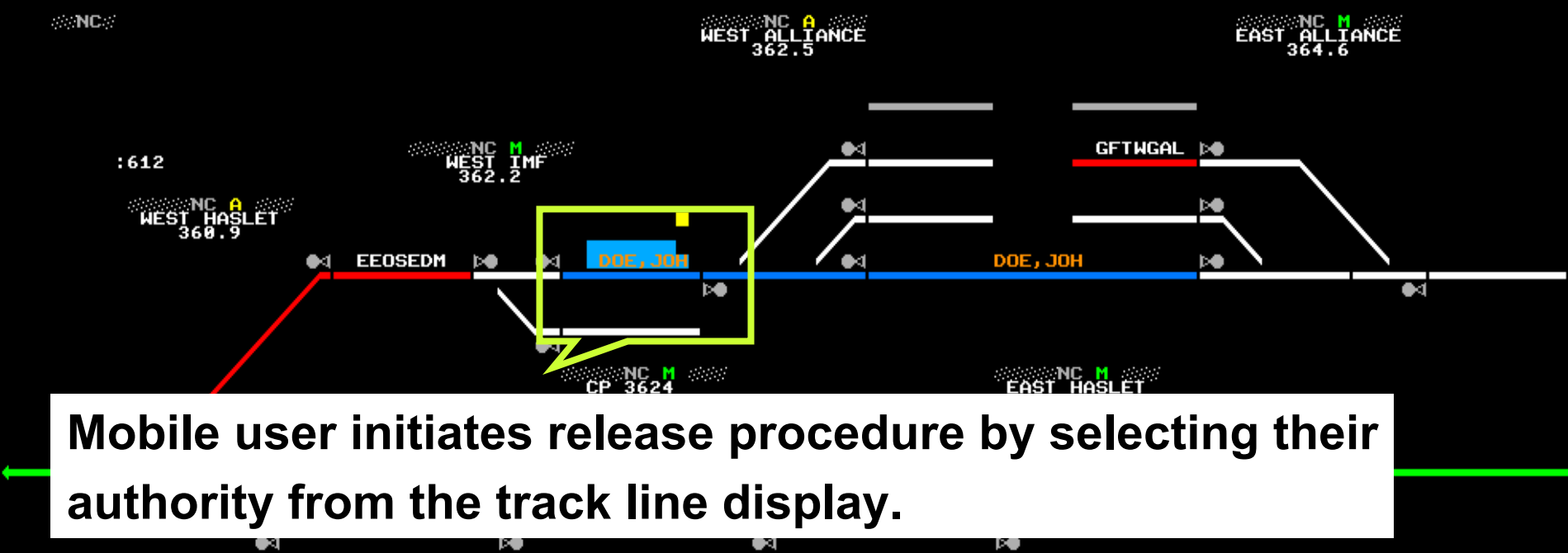Mobile workstation

Authority is now in effect.

The mobile users can now view authorities and can gain piece of mind knowing that blocking is in place protecting their limits.
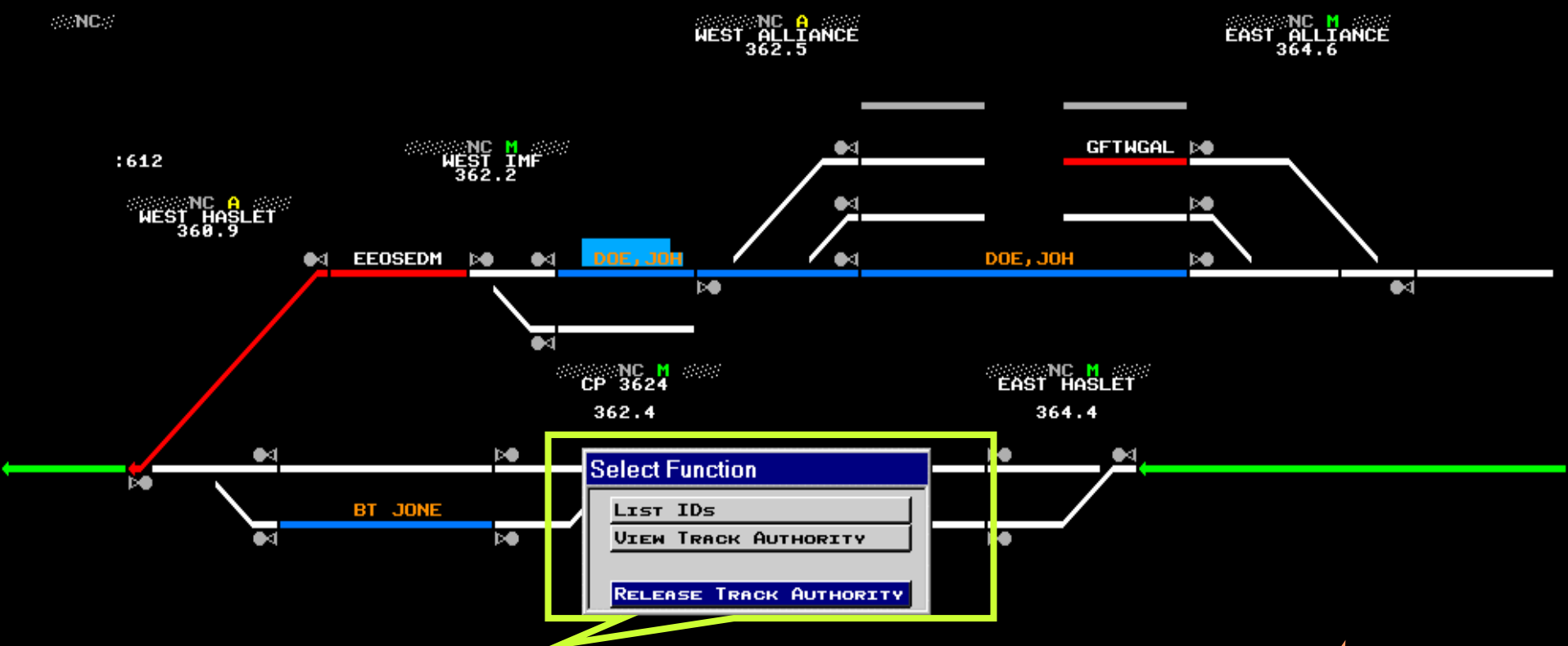
Mobile workstation

EASTBOUND TRAINS

	TRAIN ID	ID UNIT	PRI	LAST OS STATION ARR/DEP	SCHEDULE ADHERENCE	LEN	LDS	EMP	TON	MAX SPD	HPT	TPOB	ENGINEER CONDUCTOR	HOS
G1	GFTWGAL101	BNSF..4866 4866-5567	5.0	*MOVED 14:51C										

WESTBOUND TRAINS

	TRAIN ID	ID UNIT	PRI	LAST OS STATION ARR/DEP	SCHEDULE ADHERENCE	LEN	LDS	EMP	TON	MAX SPD	HPT	TPOB	ENGINEER CONDUCTOR	HOS
W1	EEOSEDM228	BNSF..6566 6566	5.0											
H1	HAMATEM122	BNSF..4671 4671	5.0	PONDER D-13:58C										

INACTIVE TRAINS

	TRAIN ID	ID UNIT	PRI	LAST OS STATION ARR/DEP	SCHEDULE ADHERENCE	LEN	LDS	EMP	TON	MAX SPD	HPT	TPOB	ENGINEER CONDUCTOR	HOS
Z1	ZBOBBIL119	BNSF..6969 6969	5.0							70			BR TOMLIN TR FREEMAN	

ACTIVE EQUIPMENT

EQUIPMENT ID	TITLE	NAME	EQUIPMENT ID	TITLE	NAME
Q1 BT JONES		BT JONES	Q2 DOE,JOHN		DOE,JOHN

PRE-ENTERED EQUIPMENT

EQUIPMENT ID	TITLE	NAME	EQUIPMENT ID	TITLE	NAME
AR THOMPSON		AR THOMPSON	TO BEOR		TO BEOR

TRACK AUTHORITIES

AUTH	ID NAME	TYPE	TRACK NAME	START LIMIT	END LIMIT	FROM	UNTIL
10019	BT JONES	SOLE T&T	SIDING TK	SWITCH, WEST HASLET, SW-N	SWITCH, CP 3624, SW-N	13:59	14:45
10020	DOE,JOHN	SOLE T&T	SIDING TK	SWITCH, WEST IMF, SW-N	SWITCH, EAST ALLIANCE, SW-N	14:10	16:15

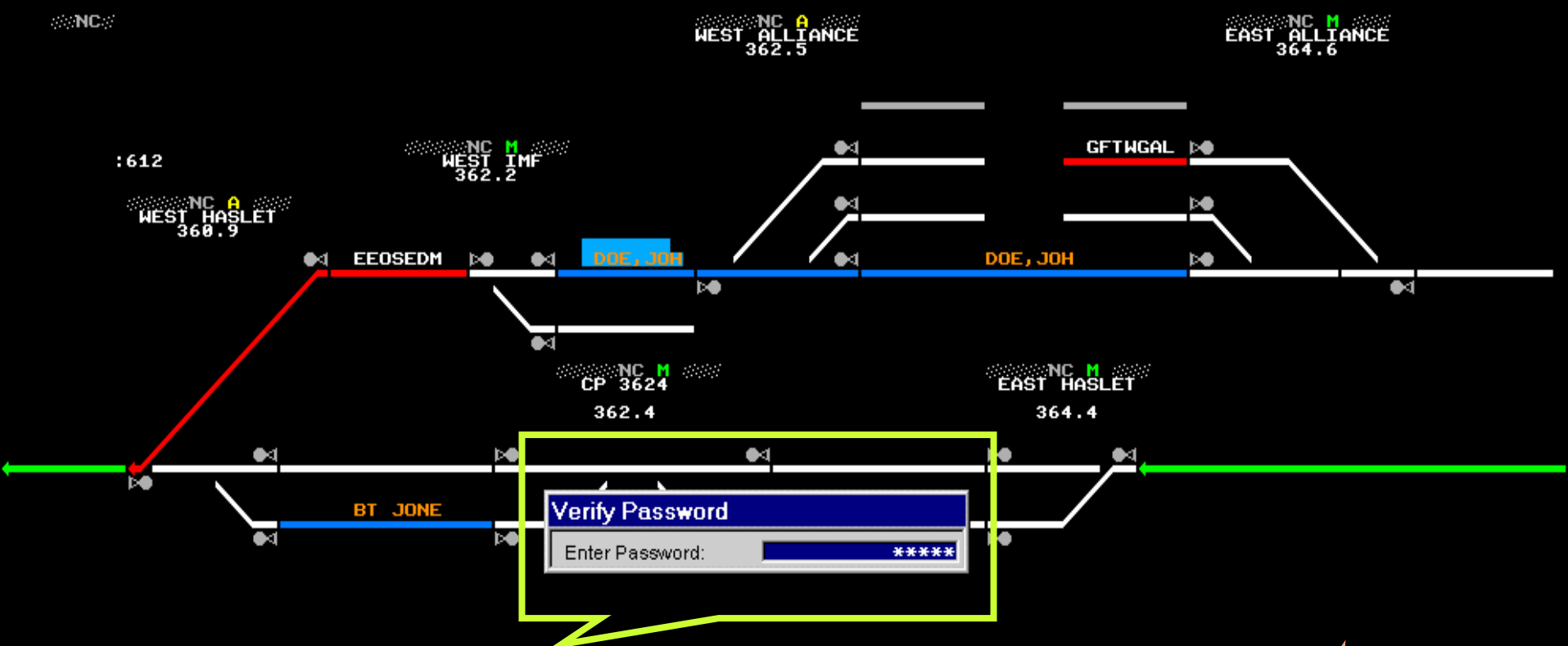**Mobile users can always view their authority limits even if communication with the mainframe fails.**
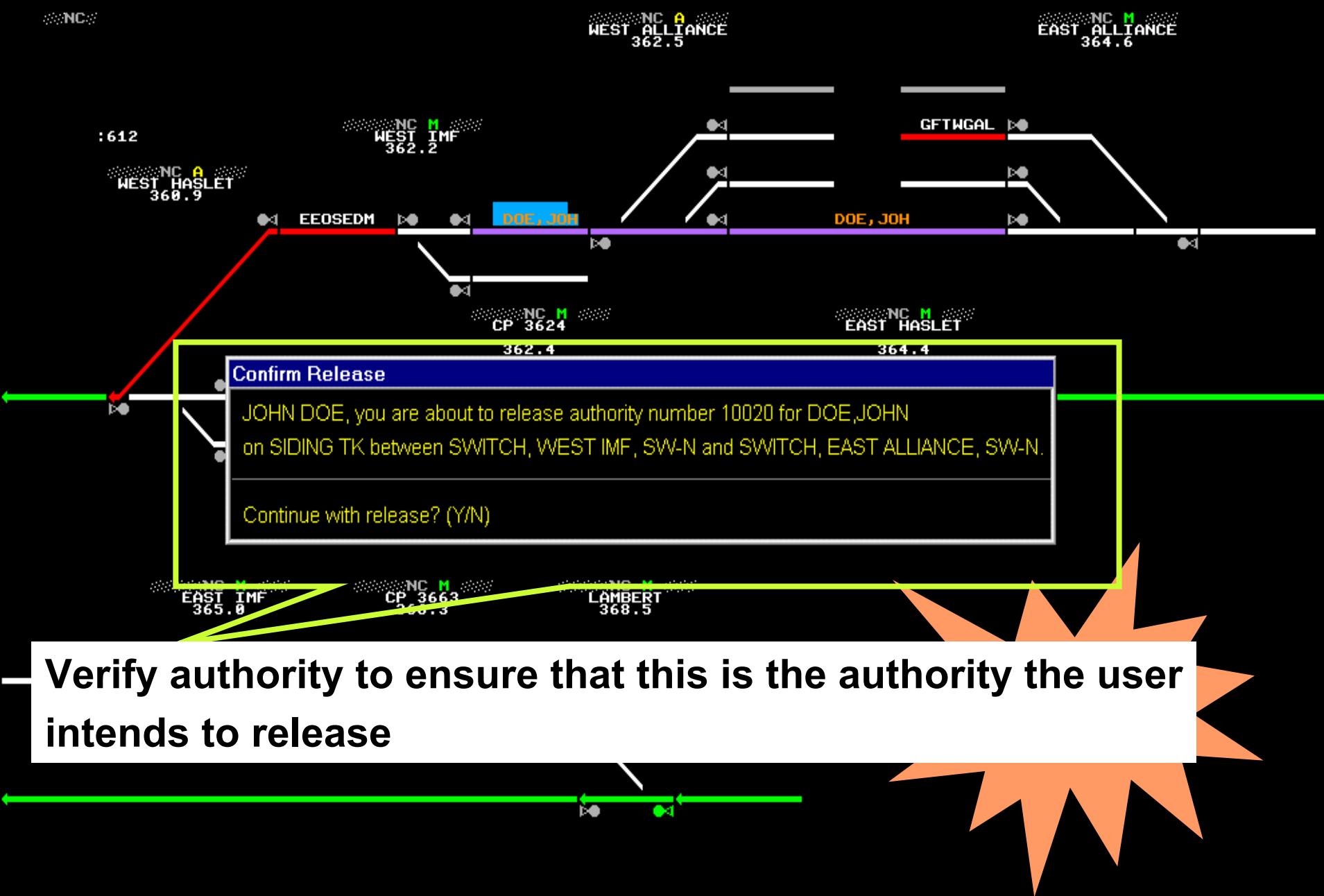
Mobile workstation

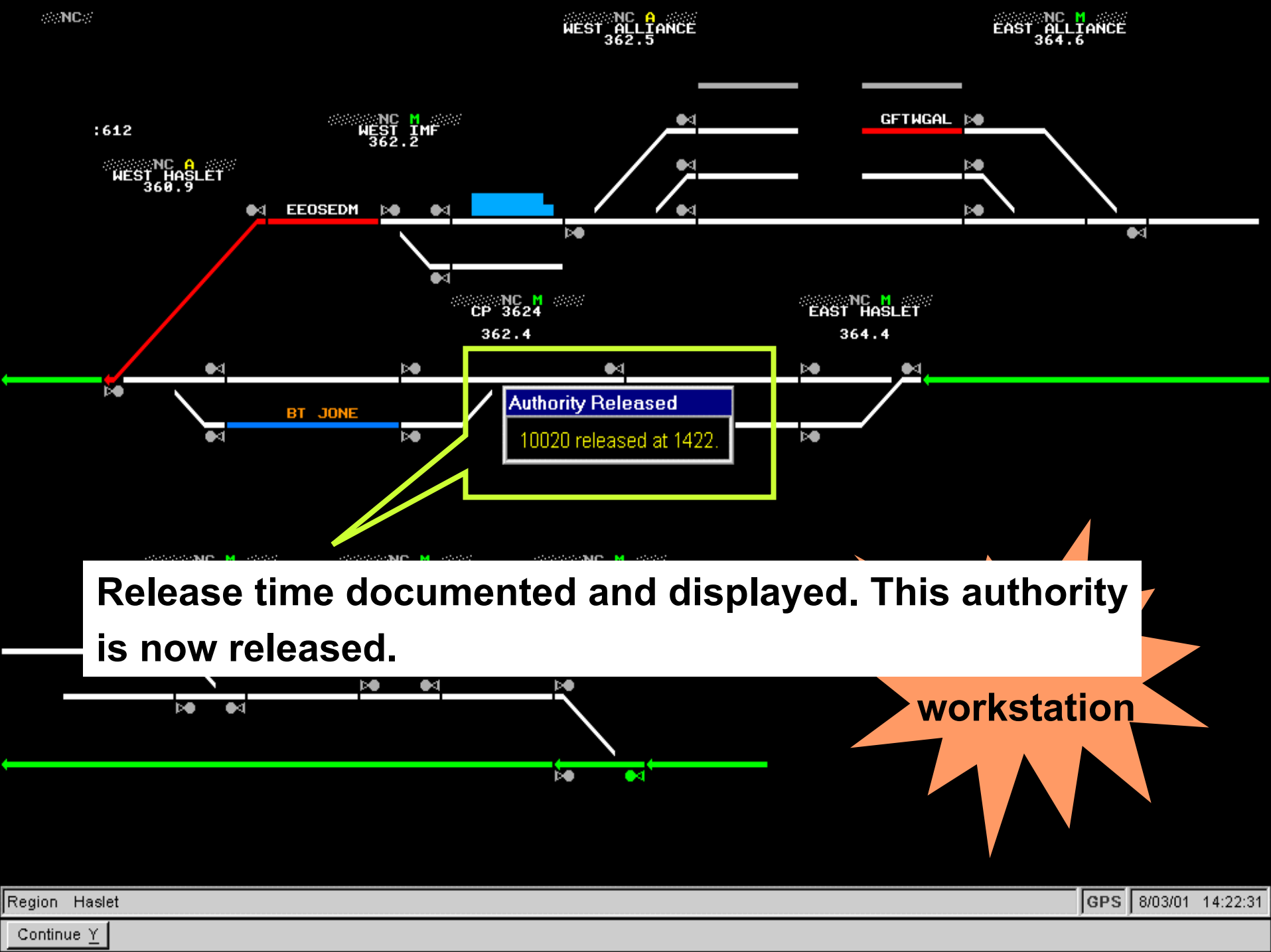| Menu	View	Wrkstn IDs	Overview	Regions	Pendleton 1	Rio Vista 2	Belt Jct 3	Saginaw 4	Haslet 5	Justin 6

FG   8/03/01   14:18:30

Mobile user initiates release procedure by selecting their authority from the track line display.

Mobile workstation
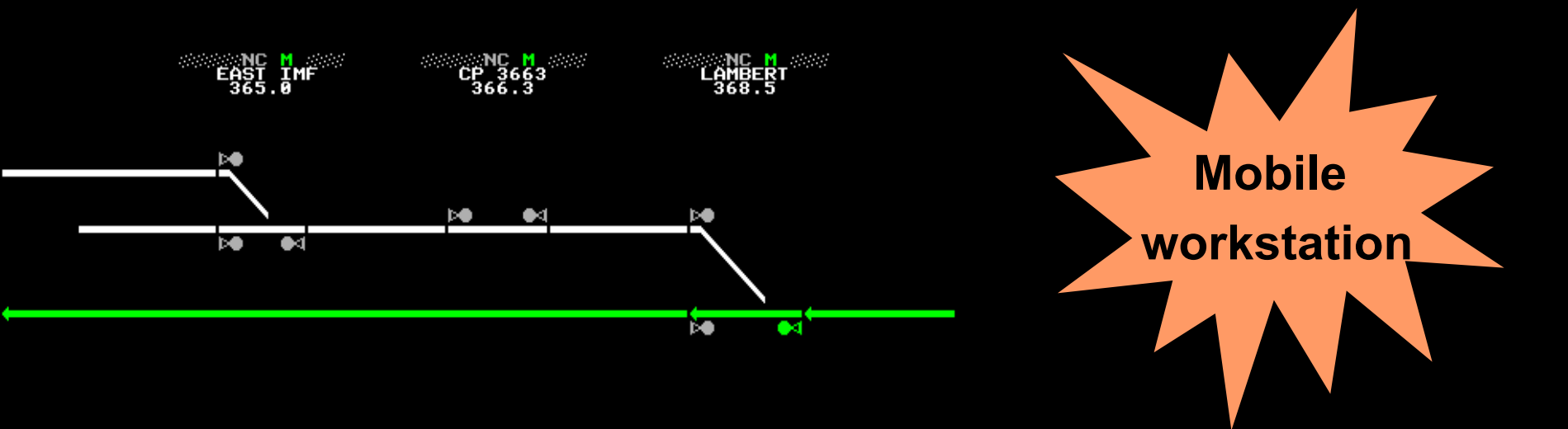
Verify password to ensure that the correct user releases authority

workstation

Verify authority to ensure that this is the authority the user intends to release

---

Confirm Release

JOHN DOE, you are about to release authority number 10020 for DOE,JOHN

on SIDING TK between SWITCH, WEST IMF, SW-N and SWITCH, EAST ALLIANCE, SW-N.

Continue with release? (Y/N)

Region Haslet

GPS | 8/03/01 14:22:24

Continue Y | Stop N

Release time documented and displayed. This authority is now released.

workstation
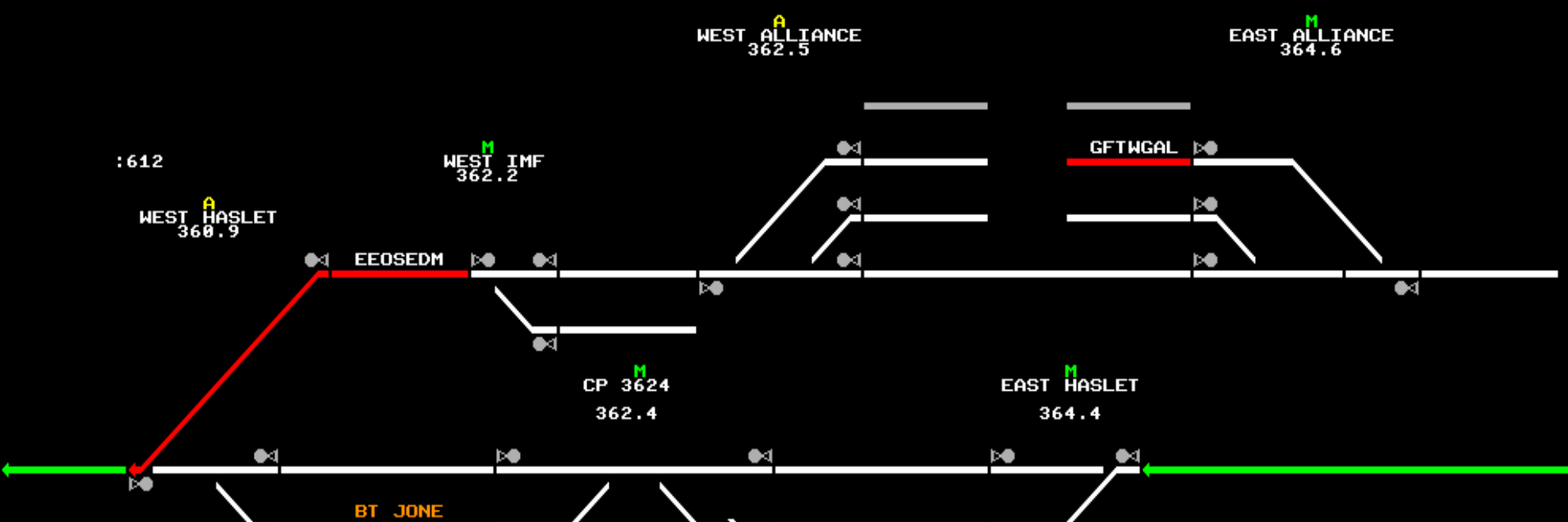
Blue bar indicates to the dispatcher that authority 10020 has been released. Blocking has been removed automatically.

Dispatcher Workstation

WEST ALLIANCE
362.5

EAST ALLIANCE
364.6

:612

WEST IMF
362.2

GFTWGAL

WEST HASLET
360.9

EEOSEDM

CP 3624
362.4

EAST HASLET
364.4

BT JONE

EAST IMF
365.0

CP 3663
366.3

LAMBERT
368.5
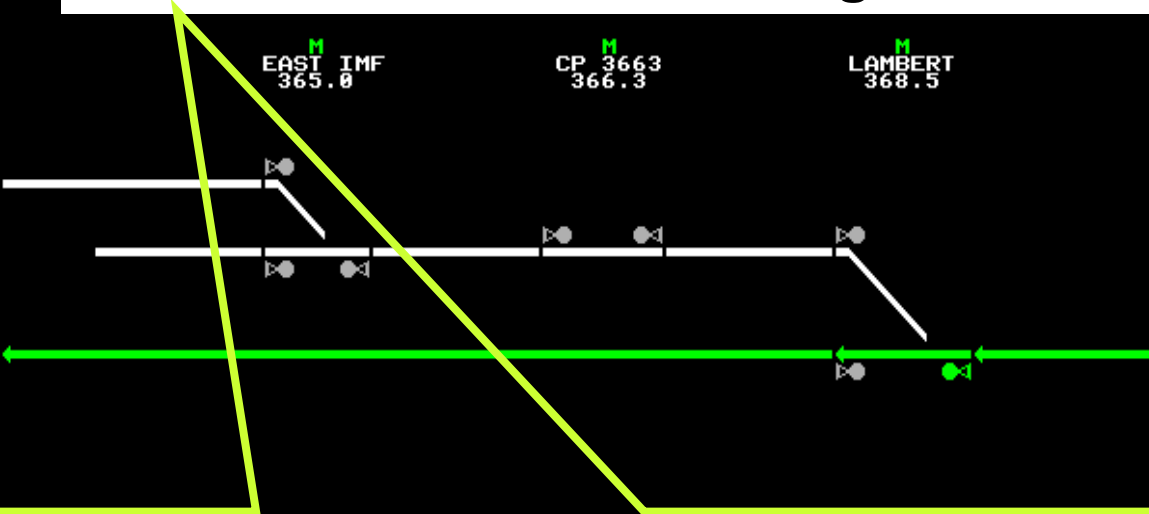
14:22:42 : EAXRLS EAXRLS - DOE,JOHN authority 10020 was released by JOHN DOE at 14:22.   FG 8/03/01 14:22:45

Idle: Move Mouse to Continue.

In this example the mobile user wishes to work between East and West Haslet raising track.
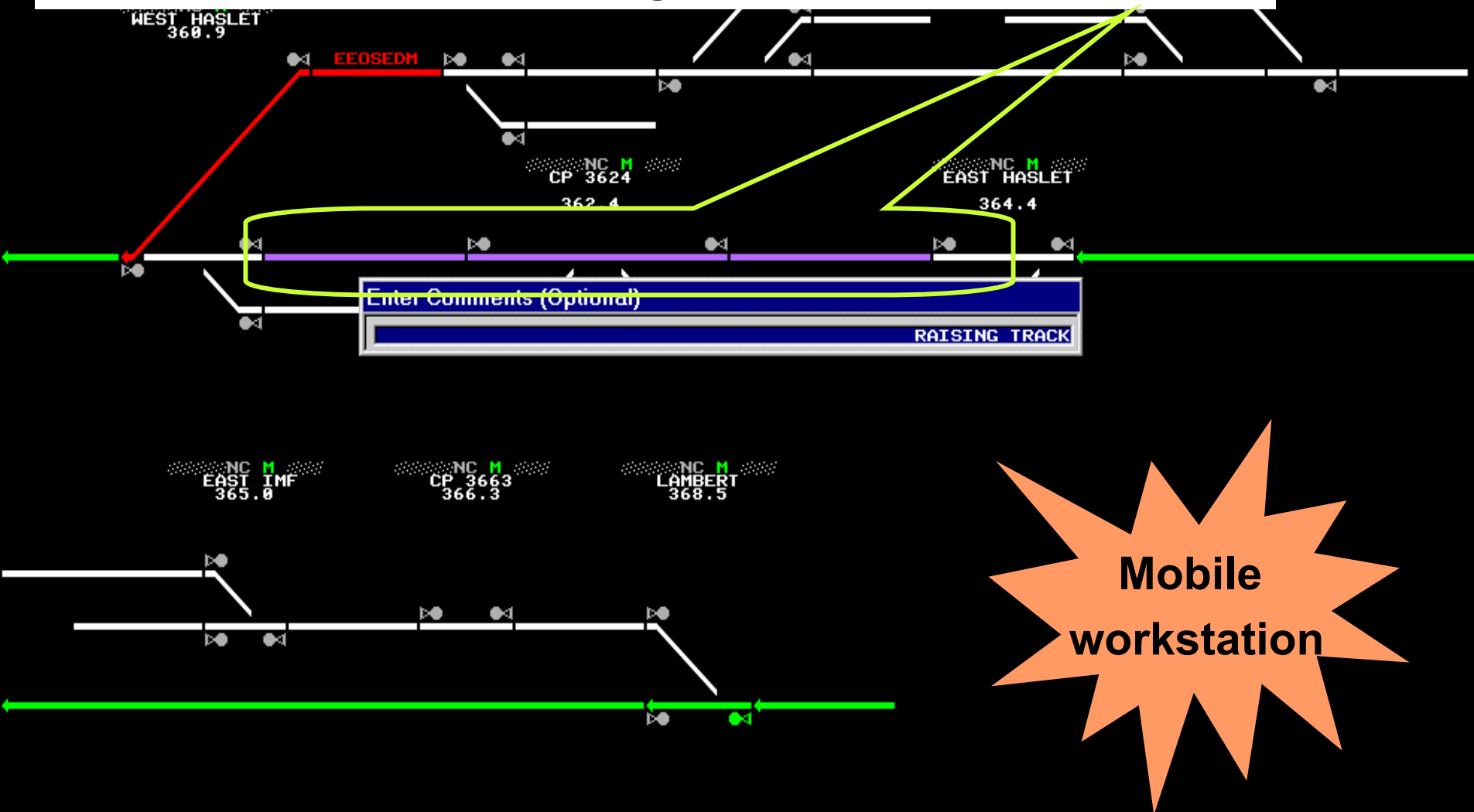
The dispatcher chooses to reject the application for authority.

WEST ALLIANCE
362.5

EAST ALLIANCE
364.6

:612

WEST IMF
362.2

GFTWGAL

WEST HASLET
360.9

EEOSEDM

DOE,JOH

DOE,JOH

EAST IMF
365.0

Select Until Time

Requested Authority:

ID   DOE,JOHN
Requested At 13:16
Limits   BETWEEN SWITCH, EAST HASLET, SW-N AND SWITCH, WEST HASLET, SW-N
Requested Time 1:30 - 3:00
Comments   RAISING TRACK

Authority Expires at 16:20

Dispatcher Workstation

QuickControl Haslet Process Requested eAX DOE,JOHN   FG 8/02/01 13:18:39

Issue   Save   Check ETAs   Reject   Send Message   Insert [Ins]

The dispatcher can send a message to the mobile user.

WEST ALLIANCE
362.5

EAST ALLIANCE
364.6

GFTWGAL

:612

WEST IMF
362.2

WEST HASLET
360.9

EEOSEDM

DOE,JOH   DOE,JOH

EAST IMF
365.0

Send Message

Send To: **WIRELESS MANAGEMENT**   No. **203**

Subject (or one line message)

REJECTED REQUESTED AUTHORITY

Pop-Up Text

(START LIMIT - SWITCH, WEST HASLET, SW-N)

(END LIMIT - SWITCH, EAST HASLET, SW-N)

I HAVE TOO MUCH TRAFFIC UNTIL 1430, CAN YOU WORK

IN BETWEEN SWITCHES?

PRESS <ENTER> TO SEND THE MESSAGE

Dispatcher Workstation

QuickControl   Haslet   Process Requested eAX   DOE,JOHN   FG | 8/02/01 | 13:22:34

Insert [Ins]

Mobil user can view the rejected application.

Mobile workstation

13:22:37 : Rejected Requested Authority - from Dispatcher Workstation 22.

GPS 8/02/01 13:22:42

Select Device

Page Up [PgUp]   Page Down [PgDn]   Escape [Esc]
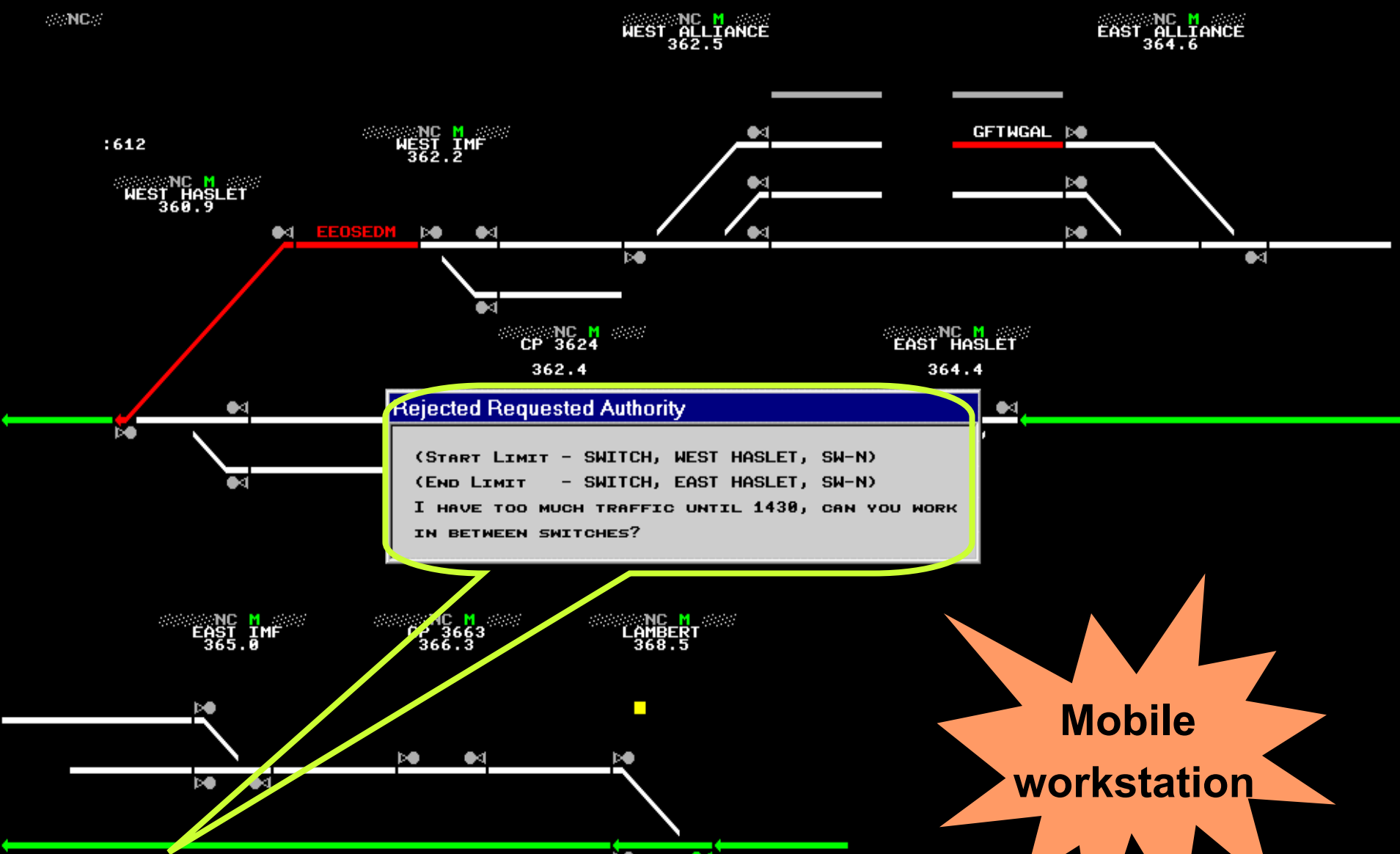
In this case the mobile user takes the dispatchers advice and makes another request to work between switches which is approved.

Approved track and time between switches

Send/Receive indicators notify the field user that the laptop is either sending or receiving data from the BNSF network.

Mobile workstation

Send/Receive indicators notify the field user that the laptop is either sending or receiving data from the BNSF network.
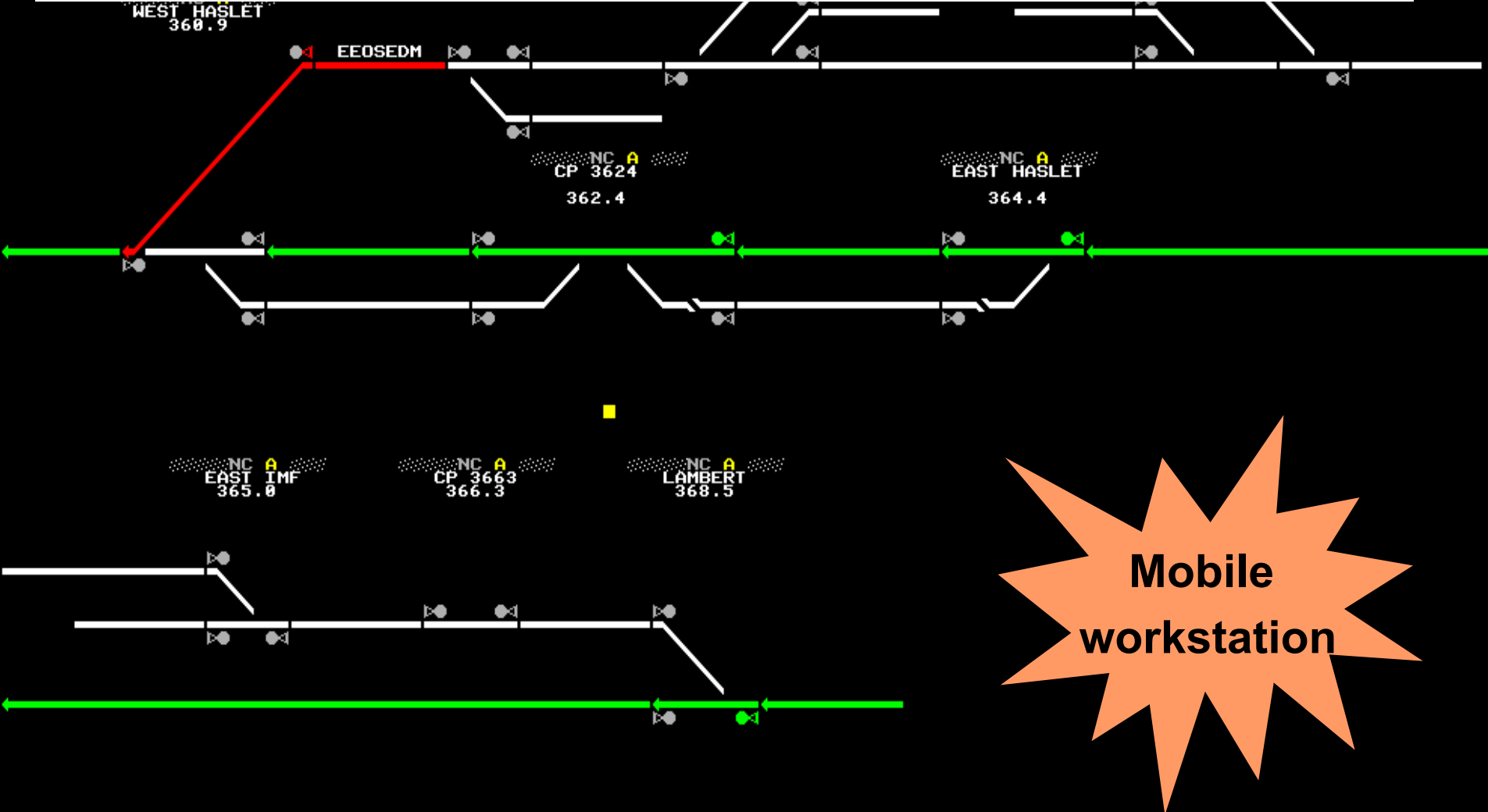
Mobile workstation
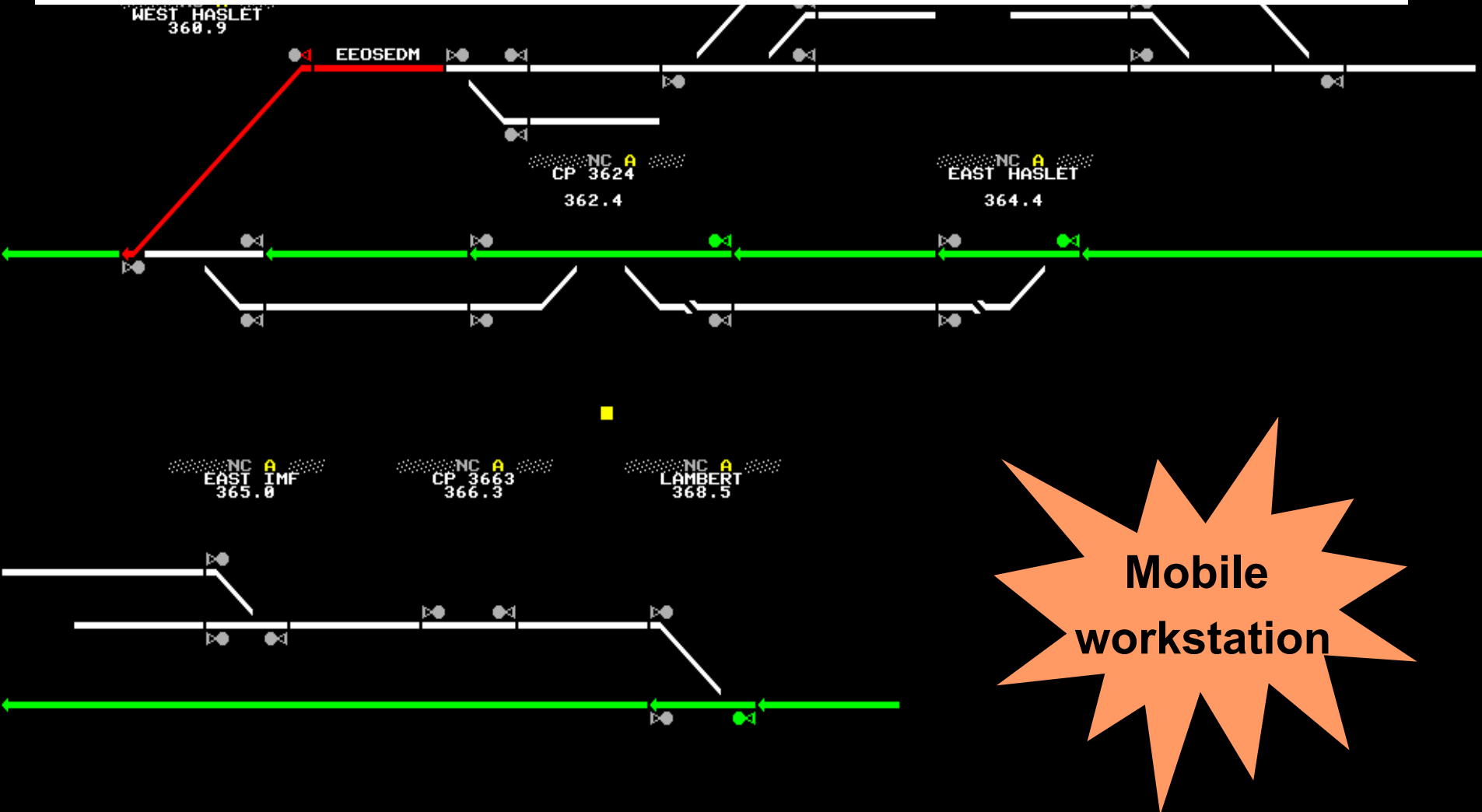
Send/Receive indicators notify the field user that the laptop is either sending or receiving data from the BNSF network.
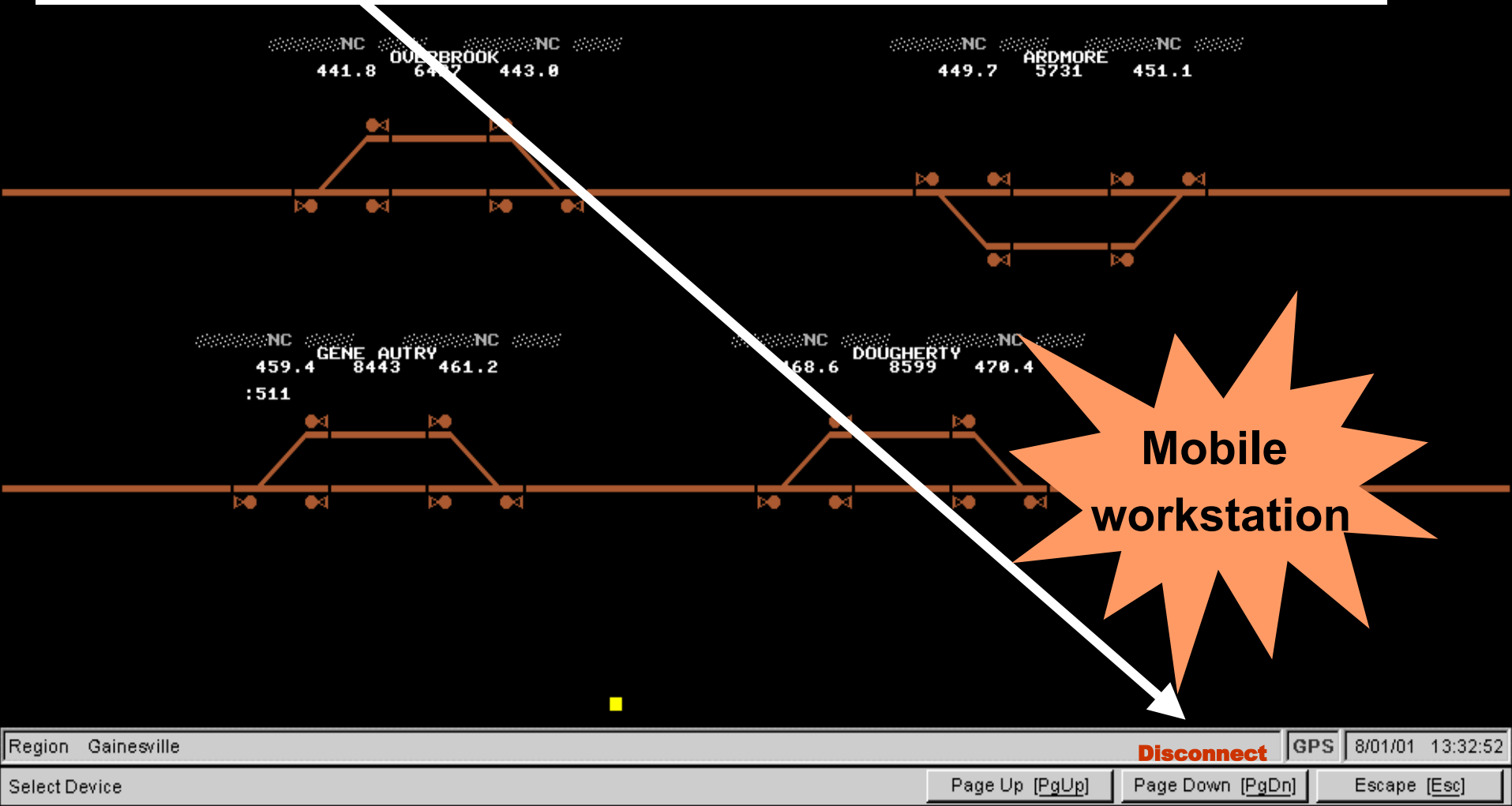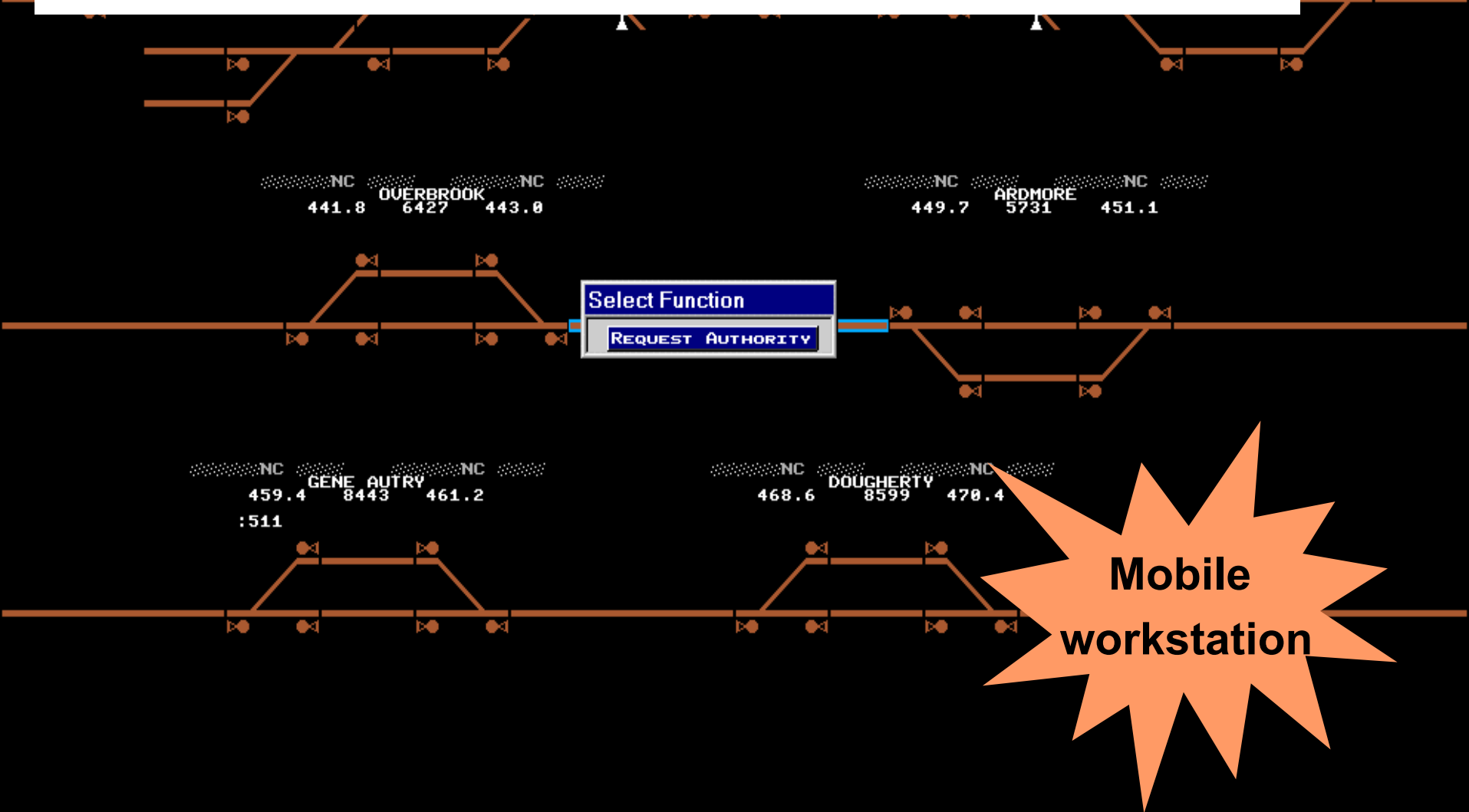
Mobile workstation

When the laptop is no longer communicating with the BNSF network the SND/RVC section will show **Disconnect.** After about 4 minutes the laptop track line display will indicate **Code Brown**.

Mobile workstation
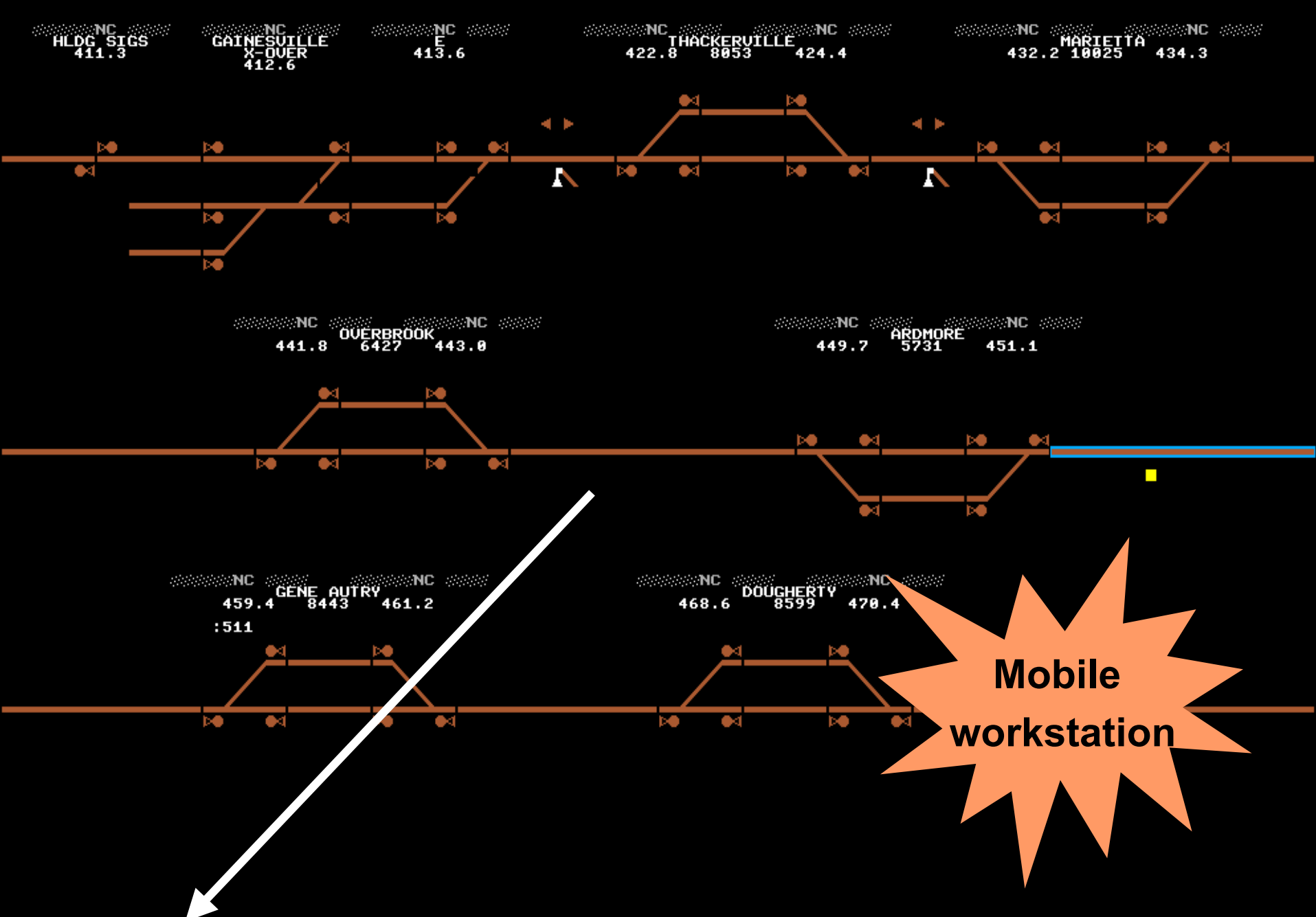
When the field user attempts to request authority in these limits.

NC HLDG SIGS 411.2   NC GAINESVILLE Y-OVER 412.6   NC E   NC THACKERVILLE 432.8 8052 434.4   NC 433.2 10035 434.3 MARIETTA NC

NC OVERBROOK 441.8 6427 443.0   NC ARDMORE 449.7 5731 451.1 NC

Select Function
REQUEST AUTHORITY

NC GENE AUTRY 459.4 8443 461.2 NC
:511

NC DOUGHERTY 468.6 8599 470.4 NC

Mobile workstation

Region Gainesville   Disconnect GPS 8/01/01 13:33:00

An error message will be generated.

Mobile workstation

Region Gainesville | Disconnect | GPS | 8/01/01 13:33:05

NC HLDG SIGS 411.3
NC GAINESVILLE X-OVER 412.6
NC E 413.6
NC THACKERVILLE 422.8 8053 424.4
NC MARIETTA 432.2 10025 434.3

NC OVERBROOK 441.8 6427 443.0
NC ARDMORE 449.7 5731 451.1

NC GENE AUTRY 459.4 8443 461.2 :511
NC DOUGHERTY 468.6 8599 470.4

Mobile workstation

13:33:24 : TRANWRK NOWRK2 - Cannot find a workstation with Gainesville region.

Disconnect | GPS | 8/01/01 13:33:24

Select Device